DEPARTMENT OF THE ARMY
AFGHANISTAN ENGINEER DISTRICT
US ARMY CORPS OF ENGINEERS
KABUL, AFGHNISTAN
APO, AE 09356

5 November 2007

REPLY TO
ATTENTION OF:
CEAED-CT

Subject: Request for Proposal (RFP), for: D/B Warehouses (National Military Academy of Afghanistan), D/B Bathrooms (Darualaman) and D/B Parking (Camp Julian), Kabul, Afghanistan

Gentlemen:

You are requested to submit a Firm Fixed Price proposal using the streamlined task order Ordering Process to accomplish the subject work in accordance with the enclosed documents which includes Sections:

a. **Section 00010** Proposal Schedule
(Priced Contract Line Item Numbers and Cost Breakdown Sheet)

b. **Section 01010** Scope of Work.

c. **Section 01015** Technical Requirements

Technical and Pricing Proposals:

Your proposal is to consist of non-pricing (technical) information and pricing information. Narrative non-pricing information is to be included in a maximum of five pages of narrative information in accordance with the established streamlined solicitation system. Offerors are cautioned against attempting to provide additional information outside the maximum five pages such as transmittal or cover letters, referring to main contract submissions, or by any other means. The number of pages that an offeror may submit in regard to pricing information is limited to completed Proposal Schedule (Price Schedule), a completed Cost Breakdown Sheet, and a separate sheet for labor skill mix and estimated personnel and man-hours information. (NOTE: The Cost Breakdown Sheet shall match the pricing show on the Price Schedule, i.e., the total of the elements of cost for each item and total of all items shall agree with the Price Schedule).

The following non-pricing and pricing aspects are of interest to the Government and therefore should be precisely and specifically addressed. Failure to do so in a significant manner may result in your offer not being selected for an award.

Non-pricing proposal information will have more importance in the selection process than pricing proposal information. Nevertheless, the Contracting Officer reserves the right to make an award to an offeror whose non-pricing presentation is less favorable than another offeror's proposal where the disparity, either up or down, in proposed costs is significant, particularly as they compare to the Government's estimates.

The area of non-pricing interest to the Government is for a Contractor to convincingly demonstrate how its **experience**, as applied to this particular task order work, will result in a successful project. Each proposal

The area of non-pricing interest to the Government is for a Contractor to convincingly demonstrate how its **experience,** as applied to this particular task order work, will result in a successful project. Each proposal will be rated as Technically Acceptable or Technically unacceptable.

The Government will evaluate the offeror's experience to verify whether the offeror has five years minimum design and construction experience with similar structures.

The pricing related areas of interest to the Government are: (i) labor skill mix with accompanying estimated numbers of personnel and corresponding man-hours and (ii) cost proposal in accordance with the Government provided "Proposal Schedule/Price Schedule" and "Cost Breakdown Sheet".

This task order will be awarded as a firm-fixed price contract. The Contracting Officer reserves the right to enter into discussion with one or more offerors; however, pre-award discussions are not presently contemplated. **The basis of award for this task order is Lowest Price Technically Acceptable.**

No legal liability on the part of the Government for payment of any monies shall arise for preparation of proposals under this request.

Your proposal must be submitted and received no later than 5 PM, on 16 November 2007, to the attention of Stella Lejeune. **Proposals shall be submitted by hand or by courier at the USACE compound in Kabul. No e-mail submissions will be accepted.** Negative replies are requested.

Technical questions shall be addressed in writing to: Stella Lejeune, via email to **Stella.M.Lejeune2@usace.army.mil**.

Please date, sign and return this letter as acknowledgement of receipt. Acknowledgment and questions in regards this request **shall be addressed to: Stella Lejeune via e-mail to Stella.M.Lejeune2@usace.army.mil.**

Sincerely,

Stella M. LeJeune
Contracting Officer

RECEIPT ACKNOWLEDGED

_____
(Signature & Date)

_____
(Print Name & Title)

Solicitation No.

US Army Corps
of Engineers
Afghanistan Engineer District

WAREHOUSES AT NMAA, TEMPORARY BATH AT DARULAMAN GARRISON AND PARKING LOT AT CAMP JULIAN

Kabul, Afghanistan

Design/Build Project Specifications And Drawings

Proposal Requirements, Contract Forms, Conditions of the Contract

November 2007

THIS IS A SINGLE-PHASE REQUEST FOR PROPOSAL

TABLE OF CONTENTS

DESIGN BUILD SPECIFICATIONS
FOR

Warehouses at NMAA, Temporary Bath at Darulaman Garrison & Vehicle Parking at Camp Julian

Kabul, Afghanistan

SECTION 00010

PROPOSAL SCHEDULE

The Contractor shall provide a price for all items, including those labeled, "Optional Items." The Government will evaluate the Contractor's entire proposal to determine which proposal represents the best value to the Government.

No.	Description	Qty	Unit	Unit Price	Total Amount
1.	**Base Proposal:**				
0001	Design Costs:	1	LS	xxx	$_____
0002	Mobilization	1	LS	xxx	$_____
0003	Demobilization	1	LS	xxx	$_____
0004	As-Built Drawings	1	LS	xxx	$_____
0006	Building (Construction)				
0006AA	Item-1: Warehouses at NMAA	1	LS	xxx	$_____
0006AB	Item-2: Temporary Bath Facilities at Darulaman Garrison	1	LS	xxx	$_____
0006AC	Item-3: Vehicle Parking Lot Camp Julian	1	LS	xxx	$_____
	Sub-total Buildings only				**$**_____
TOTAL BASE PROPOSAL ITEMS (total of all above costs - includes design and construction)					$_____
TOTAL PROPOSAL					$_____

PROPOSAL SCHEDULE NOTES

1. Offeror shall submit prices on all items.

2. All costs associated with this project i.e., security, insurance etc.,) shall be included in the line items in the bidding schedule.

END OF SECTION

SECTION 01010

SCOPE OF WORK

1. GENERAL

The project consists of the design and construction of K-Span buildings for Warehouses at National Military Academy of Afghanistan (NMAA), Temporary Bath Facilities at Darulaman Garrison and a Vehicle Parking Lot at Camp Julian within the vicinity of Kabul, Afghanistan. Refer to Appendix-A and B for approximate site locations. The project is defined as the design, material, labor, and equipment to construct buildings, parking, utilities and other infrastructures. The work in this contract shall meet and be constructed in accordance current U.S. design and International Building Codes (IBC), Life Safety Codes (NFPA-101), Force Protection and security standards. A partial listing of references is included herein:

IBC, International Building Codes 2003
NFPA 101, Life Safety Codes
UFC 4-010-01, DoD Minimum Anti-Terrorism Standards for Buildings.

1.1. ENGLISH LANGUAGE REQUIREMENT

All information shall be presented in English. The Contractor shall have a minimum of one English-speaking representative to communicate the COR at all times when work is in progress.

1.2. SUBMITTALS

Submittals and a Submittal Register are required as specified in Section 01335 of the Basic Contract.

1.3. COST ESTIMATE

The contractor shall prepare a parametric construction cost estimate for AED Engineering data collection purposes. The contractor shall prepare a thorough, well-supported, estimate reflecting the final design features, construction schedule and conditions, and any construction phasing requirements. The cost estimate shall be submitted as part of the 35%, 99% and Final design submittals are required for this contract.

1.4. CQM TRAINING REQUIREMENT

Before project design and construction begin, the Contractor's Quality Control Manager is required to have completed the U.S. Army Corps of Engineers CQM course, or equivalent. The Construction Trades Training Center (CTTC) in Jalalabad, Afghanistan provides a course that satisfies the requirement. Courses are offered at regular intervals. For enrollment and course information contact CTTC at the following:

Mhd. Haris
e-mail: mharis@afghanreconstruction.org
Telephone: 0700 08 0602

Pervaiz
e-mail: adpzmuj@yahoo.com
Telephone: 0700 61 3133

2. LOCATION

The proposed buildings and facility are located in 3 different sites at NMAA, Darulaman Garrison and Camp Julian in Kabul, Afghanistan.

3. UNEXPLODED ORDNANCE (UXO)

3.1. UXO REMOVAL AND CLEARANCE

The contractor is not responsible for the clearance or removal of mines and unexploded ordnance (UXO) from the site prior to the commencement of construction.

It is the responsibility of the Contractor to be aware of the risk of encountering UXO/mines and to take all actions necessary to assure a safe work area to perform the requirements of this contract. The Contractor assumes the risk of any and all personal injury, property damage or other liability arising out of or resulting from any Contractor action taken hereunder. The Contractor and its subcontractors may not handle, work, move, transport, render safe, or disarm any UXO/mine, unless they have appropriate accreditations from the MAC.

If a UXO/mine is encountered during project construction, UXO/mine disposal shall be handled in accordance Section 01015, Technical Requirements.

4. SUMMARY OF WORK

4.1. CONTRACTOR REQUIREMENTS

The contractor shall design and construct the facilities as a design-construct contract and shall be in accordance the requirements stated in Section 01015: TECHNICAL REQUIREMENTS. Refer to attachment following this section for more specifics for required spaces. The design and construction work shall include but not be limited to that shown in attached table and described herein.

4.1.1. GENERAL REQUIREMENTS FOR FACILITIES

All requirements set forth in the Scope of Work, but not included in the Technical Requirements, shall be considered as set forth in both, and vice versa. Provide heating and cooling for all facilities unless otherwise stated in Section 01010 or 01015.

All standard construction amenities and details such as heating, lighting, site drainage, utility connections, etc. shall be implied as a design and construction requirement. Drawings referenced are contained in Section 01015.

In general, this project consists of designing and constructing of the following:

4.1.2. BASE BID

The project consists of the design and construction of the following items:

Item-1: K-Span Warehouses-1 and 2 at NMAA

Attached Image and Drawings: Appendix-A1 through A10

Building Type: Warehouses for storage of supplies of US Government and NMAA.

Construction Type: Permanent with Life Expectancy of Minimum 20 Years, Fire-Resistant.

Configuration: 1-Story, Long-Span. Height of the K-Span shall be designed for most Economical Construction and Energy Conservation. Both Warehouses will be Air-conditioned as required under HVAC. Therefore, the Rise of K-Span Roof shall be kept to optimum height. See Appendix-A10.

Dimensions/Size: 70.0M Long x 20.0M Wide (Nominal) for each Building.

Basic Structural Materials: Floor: Concrete Floor Slab-On-Grade to support Truck (7.0 Metric Tons) Entering one side and Exit at other end. Stem Wall: 3.0M High, Concrete or CMU with concealed or protected Insulation. Roof: K-Span (Pre-Engineered).

Site Works: Earthwork for Warehouse-1 has been partially Filled and Compacted. Earthwork for Warehouse-2 requires full execution.

Road Work: The Contractor shall construct asphalt paved entrance and exit driveways to both warehouses and an asphalt paved access road, as shown in Appendix A4. The driveways and access road shall be a minimum 7.3M wide. The length of the driveways shall extend from the nearest road to the warehouse doors. A minimum turning radius of 19M shall be used for the driveways and access road.

Exterior Stairs and Steps: Reinforced Concrete, if required.

Basic Roofing Materials: Pre-engineered K-Span Metal Roof Curve with Ribs. Metal Roof shall be Pre-finished.

Energy Conservation: Provide Insulation with R-Value as specified under Section 01015 - Technical Requirements (Mechanical & HVAC) to building's enclosure (Roof, Walls and Door). Wall Insulation shall be Rigid type and protected by Plywood ¾" Thick up to 2.4M High. Secure Plywood sheet to Concrete or CMU wall and paint with same color as specified for Interior and Exterior.

Roofing Drainage: Provide Gutter and downspout and direct to nearest Storm Drainage Main.

Exterior Wall: Reinforced Concrete, CMU or 3D-Panel.

Doors: Door shall be Steel Leaves and Frames. Provide Sliding Steel Doors at both ends. Doors shall be Bi-parting with clear opening of 4.00M x approx 4.50M High to allow for Truck entering K-Span building and for moving large equipment in-out. Provide Swing Door for Egress at each End of Building per Safety Codes.

Door Hardware: Provide complete sets of Hardware to all Doors. Heavy-duty commercial Grade. Do not provide Louvers at Doors.

Exterior Window: Not Required.

Exterior Finishes: All visible Concrete and CMU surfaces shall have Stucco finish Paint. 3D-Panel shall be painted. Color shall be "Desert Sand". Roof Cladding shall be Pre-finished (Powder-Coat). Metal Doors and Louver shall be painted.

Interior works: Include Chain-link Storage Bays, 3.0M High as shown on Appendix. Provide Chain-link Doors with size to allow for Dolly or Crane with Standard Shipping Pallet to pass through. Provide complete Hardware. Provide Service Window, 1 per each Bay (Sliding, Size 0.60M Wide x 1.0M High). Provide Stainless Steel Shelf 0.60 M Wide x 0.35M Deep).

Interior Finishes - Floor: Machine-Trowel Finish for entire warehouse areas and Extended Slab front and rear of Sliding Doors, as shown.

Interior Finishes Walls: All visible Concrete and CMU surfaces shall have Stucco and Paint finish. 3D-Panel shall be painted. Interior Chain-link Partition and Doors shall be Manufacturer Primed.

Interior Doors and Louvers: Shall be painted.

Finish-Ceiling: Prefinished Structure or Paint over Sprayed-on Insulation.

HVAC: Naturally Ventilated. Provide Fixed Louver Shut-off Damper at both Roof Gable Ends. Provide Ceiling Fans at Height of 3.60M Above Finish Floor. Fan shall be provided in 2 Rows at 10.00M On Center. Both Warehouses shall be cooled and heated by Forced Air System with Ductwork to maintain Indoor Temperature range of 50 Degree in Winter and 90 Degree in Summer. Provide room for Mechanical Unit and Fuel Tanks as required. Provide Concrete Slab Base and Chain-link cage & Gate for Outdoor unit, as required under Technical Requirement of Mechanical, HVAC.

Electrical: Power Supply to K-Span Warehouses will be from Existing Power Poles adjacent to Proposed Lots. Provide Duplex Receptacles (220V). Provide Communal Lighting per Electrical requirements for Warehouse Type.

Special Construction: Long-Span. No intermediate columns, No shear-walls or supports that obstruct open areas.

Item-2: Temporary Bath Facility at Darulaman Garrison.

Attached Drawing and Table: Appendix-B1 through B8.

Main Functions: Ablution, Toilet and Shower for ANA 1,000 Soldiers.

Construction Type: Fire-Resistant.

Configuration: 1-Story, Modular CONEX Units.

Dimensions/Size: Designer of D-B Contractor shall compile spaces from Table (Appendix-B7) plus maximum of 20% Circulation.

Basic CONEX Materials: Floor: Lightweight Concrete on Steel CONEX Floor. Wall: Metal, Insulated. Ceiling. Roof Assembly: Metal, Insulated.

Stairs and Steps: Reinforced Concrete if required for Elevated Floor.

Basic Roofing Materials: Roof shall be basic Unit's Top. Pitch Roof is not required for CONEX.

Energy conservation: Insulated Building Enclosure, all sides. Provide Insulation with R-Value as specified under Section 01015 - Technical Requirements (Mechanical & HVAC) to building's enclosure (Roof, Walls and Door). Provide Windows for Natural Ventilation and Light.

Doors: Door shall be Swing type with Steel Leaves and Frames. Provide complete sets of Hardware to all Doors (Heavy-duty type). Do not provide Louvers at Doors.

Interior Partitions: Provide Stainless Steel Panels.

Interior Finishes - Floor: Nonslip Ceramic, Mosaic Tile or Terrazzo Tile.

Finish-Bases: Stainless Steel.

Interior Finishes Walls: Stainless Steel Panels or Prefinished Panels.

Finish-Ceiling: Pre-finished, Fiberglass Panels.

HVAC: Provide Exhaust Fans for Ventilation. Each Module will be heated with Electric Unit Heater. Heating Unit, Thermostat and Power Outlets must be concealed inside compartment lock.

Plumbing: According to the on-site O&M site managers at Darulaman Garrison, there is sufficient existing water supply and wastewater treatment capacity. Contractor shall obtain site utility drawings from on-site O&M managers and verify existing utilities that are located adjacent to the proposed site of this facility. The Contractor shall be responsible for connecting the bath facility to the existing water distribution and wastewater collection systems (see Appendix B4 and B5 for approximate utility hook-up locations).

Plumbing Fixtures: See Minimum Requirements at Appendix-B7.

Electrical: Power line shall run from Existing Transformer at Site. No Receptacles are required.

Special Construction: Provide Base, Anchors and Hold-down for CONEX as required.

Toilet Accessories: See Schedule at Appendix-B8.

Site Work: The Contractor shall surface the area, within the site and surrounding the bath facilities, with 150mm of compacted aggregate (see section 01015, paragraph 2.3.4.2).

Item-3: Vehicle Parking at Camp Julian.

Attached Drawing/Table: Appendix-B1

Construction Type: Aggregate Parking Space for 200 vehicles with Fence. Provide 2 sets of Gates (one on each end) approximately 7.3M Wide (2 -3.65m wide leafs) x 2.4m High.

Design Vehicle: Passenger Car/Light Truck

Dimensions: Provide standard 2.5M Wide x 6.0M Long Parking Space. 90 Degree Configuration. Driveway = 7.0M Minimum.

Basic Structure: Site improvement: Leveled, compacted aggregate. Parking Area shall be minimum 150mm thick.

Fence: Shall be 2.4M High, Galvanized Steel Posts, Beams and Bracers with Chain-link. Provide Triple-Strand and Concertina Wires on top of post, with "Y" shaped outriggers (see Appendices B9 and B10 for fencing details).

Safety and Property Protection: Provide bollards constructed from steel and concrete filled at the corners of the entrance and exit gates.

4.2. WATER SYSTEM

There is an existing water supply and distribution system in place, at the Darulaman site, that includes a water well source, water well pump, water storage tanks and underground water distribution system. The Contractor shall connect the new bathroom facilities to the existing water distribution system. An approximate connection point is shown in Appendix B4. The Contractor shall coordinate with O & M on-site Managers (AED and its contractor – Contrack International Inc.), during construction of bathroom facilities and before connection to existing utilities.

4.3. SANITARY SEWER SYSTEM

There is an existing wastewater collection and treatment system in place, at the Darulaman site. The Contractor shall connect the new bathroom facilities to the existing wastewater collection system. An approximate connection point (manhole) is shown in Appendix B5. The wastewater building service connection line shall consist of gravity sewer pipe and appurtenances such as manholes, cleanouts and building service connections. The Contractor shall coordinate with O & M on-site Managers (AED and its contractor – Contrack International Inc.), during construction of bathroom facilities and before connection to existing utilities.

4.4. DEMOLITION

Minor site demolition is required prior to construction of new work mostly found in replacement work.

4.5. SITE ELECTRICAL DISTRIBUTION SYSTEM

The contractor shall design a power system for supply and distribution to all buildings and underground electrical distribution. Contractor shall connect to local power grid from an existing power poles or pad mounted transformer at the site accordingly. Contractor shall design and install all interior electrical systems and any required exterior lighting as described in section 01015, Technical Requirements. Conductors and circuits shall be size for the specific loads. All wiring shall be run and pull through conduits. All electrical design and installation shall meet NEC (NFPA 70).

4.6. FORCE PROTECTION MEASURES

Force protection design shall be in accordance Joint Security Directorate Antiterrorism/Force Protection Guide, March 2002.

4.7. TRASH POINT

The Contractor shall provide, in a location convenient for easy removal, a trash collection point. It shall be located inside the compound walls.

4.8. HVAC, Heating Ventilation Air-Conditioning

Environmental control of the facilities shall be achieved by HVAC equipment proposed by the contractor and approved by the U.S. Government. See section 01015 for scope of work required.

4.9. LIFE SAFETY

Design and Construct circulation pathways and exit stairs in accordance building code references herein. Fire sprinkler system is not required. The facility shall comply with all other safety requirements as required in references. Smoke detectors and fire alarm systems shall be installed in accordance requirements herein.

4.10. LIGHTING

General lighting shall be provided as indicated and shall meet recommendations from IESNA for each building type and function in each building. Design and installation shall meet the requirements of the NEC.

Exterior lighting shall be high intensity discharge luminaires and consistent the predominant fixture type found throughout the compound.

4.11. ELECTRICAL

The contractor shall design and construct a power system to supply necessary power to new and existing electrical loads. Additional power supply shall be obtained via the existing power distribution system. All electrical design and installation shall meet NEC requirements. Electrical receptacles shall be provided as indicated. Conductors and circuits shall be sized for the specific loads. Secondary voltage shall be 220/380V, 3-phase, 50Hz.

4.12. FENCING AND BARRICADES

Fencing shall consist of the types to create a safe working project area to ensure occupants and workers are kept safe from the construction as much as possible.

4.13. FOUNDATION DESIGN

Foundations, including subgrade, shall be designed and constructed based on recommendations from geotechnical investigation required herein.

5. COMPLETION OF WORK

Each Item shall be completed by calendar days, including government review time from Notice To Proceed (NTP) as shown in Table below:

5.1. PERFORMANCE PERIOD

For Item-1: K-Span Warehouse at NMAA, Item-2: Temporary Bath at Darulaman Garrison and Item-3: Parking at Camp Julian

Item-2: **Temporary Bath (Ablution + Toilets + Shower at Darulaman Garrison**	Completion Time From Notice to Proceed
1- Site Survey/Master Planning	10 days
2- Site Grading	65 days
3- Water Distribution System	65 days
4- Sewer Distribution System	65 days
5- Electrical System	65 days
6- Toilet Building	65 days

Item-3: Parking at Darulaman (at Camp Julian)	Completion Time
1- Site Survey/Master Planning	10 days
2- Site Grading/Parking	65 days
3- Fencing	65 days

Item-1: K-Span Warehouses at NMAA	Completion Time
1- Site Survey	5 days
2- Site Grading	180 days
3- Electrical System	180 days
4- K-Spans	180 days

5.2. LIQUIDATE DAMAGE:

Failure by the contractor to meet the deadline for 65 calendar days will require the US Government to incur costs for continuing project. For this phase Liquidated Damages per day $496.08 will be charged.

Failure by the contractor to meeting deadlines for 180 calendar days for the whole project will require the US government to incur cost for continuing project and site management on the project beyond planned time-lines. If the whole project is not completed in 180 calendar days Liquidated Damages per day $992.15 will be charged.

6. REFERENCES

Refer to Section 01015 for Technical Requirements.

-- End of Section --

SECTION 01015

TECHNICAL REQUIREMENTS

1. GENERAL

1.1. The Contractor's design and construction must comply with technical requirements contained herein. The Contractor shall provide design and construction using the best blend of cost, construction efficiency, system durability, ease of maintenance and environmental compatibility.

1.2. These design and product requirements are minimum requirements. The Contractor is encouraged to propose alternate design or products (equipment and material) that are more commonly used in the region; will be equally or more cost effective or allow for more timely completion, but furnish the same system durability, ease of maintenance and environmental compatibility. The Contractor will be required to submit information as requested by the Contracting Officer to make a comparison of the proposed alternate. All variations must be approved by the Contracting Officer.

1.3. ASBESTOS CONTAINING MATERIALS

Asbestos containing material (ACM) shall not be used in the design and construction of this project. If no other material is available which will perform the required function or where the use of other material would be cost prohibitive, a waiver for the use of asbestos containing materials must be obtained from the Contracting Officer.

1.4. SAFETY

1.4.1. Unexploded Ordnance (UXO)

1.4.1.1. UXO/Mine Discovery During Project Construction

Contractor IS NOT responsible for clearance/removal if UXO/mines are found during construction.

It is the responsibility of the Contractor to be aware of the risk of encountering UXO and to take all actions necessary to assure a safe work area to perform the requirements of this contract. If during construction, the contractor becomes aware of or encounters UXO or potential UXO, the contractor shall immediately stop work at the site of encounter, move to a safe location, notify the COR, and mitigate any delays to scheduled or unscheduled contract work. Once the contractor has informed the COR, the contractor will await further direction. The Contractor assumes the risk of any and all personal injury, property damage or other liability arising out of or resulting from any Contractor action taken hereunder.

Scrap metal shall be the property of the Host Government. The scrap metal on site shall be moved to an area away from the site perimeter as directed by the Contracting Officer's Representative and left for the Host Government to remove and/or salvage.

NOTE: For previous UXO/mine information, the following points of contact from the UN Mine Action Center of Afghanistan are provided:

Mohammad Sediq, Chief of Operations,
Email: sediq@unmaca.org
Cell: +93 070 295207

Hansie Heymans, Chief Information Officer,
Email: hansie@unmaca.org
Cell: +93 070 294286

1.4.1.2. Explosives Safety

1.4.1.2.1. General Safety Considerations

General safety considerations applicable to personnel, both essential and non-essential, at project sites where UXO may be encountered include:

a. Do not carry fire or spark-producing devices.
b. Do not conduct explosive or explosive-related operations without approved procedures and proper supervision and UXO safety support.
c. Do not become careless by reason of familiarity with UXO or the reported probability level of UXO contamination.
d. Do not conduct explosive or potentially explosive operations during inclement weather.
e. Avoid contact with UXO except during UXO clearance operations.
f. Conduct UXO-related operations during daylight hours only.
g. Employ the "buddy system" at all times.

1.4.1.2.2. Activity Hazard Analysis (AHA) briefings

a. Activity Hazard Analysis's shall be prepared in accordance with the Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1.
b. Hazard analyses will be prepared and briefed by personnel that are knowledgeable in UXO and explosives safety standards and requirements. These personnel should understand the specific operational requirement and hazard analysis methodologies. A hazard analysis will be performed for each activity to determine the significance of any potential explosive-related hazards. Explosive residues may be discovered or exposed during UXO operations in the form of powder or various granular and powder based pellets. These contaminants can enter the body through the skin or by ingestion if proper personal hygiene practices are not followed. Explosive fillers such as white phosphorus are dangerously reactive in air and acute exposure can result in serious injury to the skin, eyes, and mucous membranes. They are also a fire hazard.

Safety requirements (or alternatives) that will either eliminate the identified hazards, mitigate or control them to reduce the associated risks to an acceptable level will be developed. The adequacy of the operational and support procedures that will be implemented to eliminate, control, or abate identified hazards or risks will then be evaluated and a second risk assessment completed to verify that a satisfactory safety level has been achieved.

1.4.1.3. Notification of Noncompliance

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time or for excess costs or damages.

1.5. LIMITATION OF WORKING SPACE

The Contractor shall, except where required for service connections or other special reason(s), confine his operations strictly within the boundaries of the site. Workmen will not be permitted to trespass on adjoining property. Any operations or use of space outside the boundaries of the site shall be by arrangement with all interested parties. It must be emphasized that the Contractor must take all practical steps to prevent his workmen from entering adjoining property and in the event of trespass occurring the Contractor will be held entirely responsible.

Areas located immediately outside the construction area are known to contain mines and unexploded ordnance (UXO). Contractors assume all risks when venturing in or out of the designated work area.

1.6. TEMPORARY STRUCTURES

The Contractor shall erect suitable temporary fences, lighting, and necessary structures to safeguard the site, materials and plant against damage or theft and for the protection of the general public and shall adequately maintain the same throughout the course of the contract.

1.7. SUBCONTRACTORS

Compliance with the provisions of this section by subcontractors will be the responsibility of the contractor.

1.8. LIST OF CODES AND TECHNICAL CRITERIA:

The following codes and technical criteria and those referenced therein shall be required for this project. References within each reference below shall be required and adhered to. This list is not exhaustive and is not necessarily complete.

AABC - Associated Air Balance Council (National Standards for total System Balance)
ACI 318 Building Code Requirements for Structural Concrete (latest edition), American Concrete Institute
Air Force Manual 32-1071, Security Engineering, volumes 1-4, 1 May 1994
American Water Works Association, ANSI/AWWA C651-99 standard
ARI - Air Conditioning and Refrigeration Institute
ASCE 7-02, Minimum Design Loads for Buildings and Other Structures, 2002
ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy
ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality
ASHRAE Standard 62.2-2004, Ventilation and Acceptable Indoor Air Quality for Low-Rise Residential
ASHRAE Standard 90.1-2001, Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE Standard 90.2-2004 with 2006 supplement, Energy-Efficient Design of Low-Rise Residential Buildings
ASME - American Society for Mechanical Engineering
ASTM - American Society for Testing and Materials
AWS - American Welding Society
EIA ANSI/TIA/EIA-607: (1994) Commercial Building Grounding/Bonding Requirement Standard.
Factory Mutual (FM) Approval Guide-Fire Protection (2002).
IBC - International Building Codes, 2003 (and its referenced codes including those inset below)
  IMC – International Mechanical Code
  IPC – International Plumbing Code
Lighting Handbook, IESNA, latest edition
MIL-HDBK-1190, Facility Planning and Design Guide
Codes and Standards of the National Fire Protection Association (NFPA)
[as applicable and enacted in 2002 or later, unless otherwise noted].
National Electrical Safety Code (NESC), Institute of Electrical and Electronic Engineers (IEEE C2), 2002 edition
NFPA 10, Portable Fire Extinguishers, 2002 edition
NFPA 70, National Electrical Code, 2002 edition
NFPA 90A, Air Conditioning and Ventilating Systems, 2002 edition
NFPA 101, Life Safety Code, 2003 edition
Plumbing and Drainage Institute (PDI-WH-201) water hammer arrestors
SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Standards and Guides, latest editions
TM 5-785 Weather Data
TM 5-802-1 Economic Studies

TM 5-805-4 Noise and Vibration
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UFC 3-410-01FA Heating, Ventilating and Air Conditioning, Change 1, 15 May 2003
UFC 3-410-02A, HVAC Control Systems. 15 May 2003
UFC 3-430-01FA, Heating and Cooling Distribution Systems, 27 Jy 2003
UFC 3-501-03N, Electrical Engineering Preliminary Considerations, 16 Jan 2004
UFC 3-520-01, Interior Electrical Systems, 10 June 2002
UFC 3-530-01AN, Design: Interior and Exterior Lighting and Controls, 19 Aug 2005
UFC 3-550-03FA Design: Electrical Power Supply and Distribution Systems, 1 Mar 2005
UFC 3-600-01, Design: Fire Protection Engineering for Facilities, 26 Sept 2006
UFC 4-010-01, Design: Minimum DoD Antiterrorism Standards for Buildings, 22 Jan 2007
UFC 4-010-02, DoD Minimum Antiterrorism Standoff Distances for Buildings, 19 Jan 2007
UFC 4-020-01FA, Security Engineering: Project Development, 1 Mar 2005
UFC 4-020-02FA, Security Engineering: Concept Design, 1 Mar 2005
UFC 4-020-03FA, Security Engineering: Final Design, 1 Mar 2005
UFC 4-020-04FA, Electronic Security Systems: Security Engineering, 1 Mar 2005
Underwriters' Laboratories (UL) Fire Protection Equipment Directory (2002)
UL Standards (as applicable)
USCINCCENT OPORD 97-1

The publications to be taken into consideration shall be those of the most recent editions. Standards other than those mentioned above may be accepted if the standards chosen are internationally recognized and meet the minimum requirements of the specified standards. The Contractor shall be prepared to submit proof of this if requested by the Contracting Officer.

2. SITE DEVELOPMENT:

2.1. GENERAL

The project includes furnishing all materials, equipment and labor for constructing water, sanitary sewer and storm sewer service lines, as applicable, and connecting to the existing sewer networks.

2.2. ENVIRONMENTAL PROTECTION

2.2.1. APPLICABLE REGULATIONS

The Contractor shall comply with all Host Nation laws, rules, regulations or standards concerning environmental pollution control and abatement with regard to discharge of liquid waste into natural streams or manmade channels. The contractor shall review host nation and U.S. Government environmental regulations with the contracting officer prior to design and discharge of any liquid wastes into natural streams or manmade channels.

2.2.2. NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed non-compliance with the foregoing provisions. The Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part

of the work until satisfactory corrective action has been taken. No extension of time or damages will be awarded to the Contractor unless it was later determined that the Contractor was in compliance.

2.2.3. SPILLAGES

Measures shall be taken to prevent chemicals, fuels, oils, greases, bituminous materials, waste washings, herbicides and insecticides, and construction materials from polluting the construction site and surrounding area.

2.2.4. DISPOSAL

Disposal of any materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., shall be taken to a dumpsite off site and subject to the approval of the Contracting Officer. Burning at the project site for the disposal of refuse and debris will not be permitted.

2.3. CIVIL SITE DEVELOP\MENT

2.3.1. SITE PLAN

The contractor shall locate the facilities in general agreement with the drawings included and any requirements in the Scope of Work 01010. All buildings, roads, parking areas, entry control points, guard towers, wall, fence, utility structures, and other site features shall be clearly defined and dimensioned on the site plan. Buildings shall be located to provide access for emergency vehicles and fire fighting. Roads and parking areas shall be designed for turning radius of the largest vehicle entering the compound. The site plan shall show geometric design of the site, including applicable dimensions of all exterior facilities, mechanical equipment, pavements, utilities, etc. Required facilities are described in the following sections of this specification. All roads and areas where tractor-trailer vehicles will travel shall be designed for the worst case turning radius. Design and construction of roads and pavements shall be based on recommendations from geotechnical investigation required herein.

All site plans and master plans shall be drawn in the following projection and datum for incorporation into the U.S. Army Corps of Engineers GIS system:

WGS 1984 UTM Zone 42 N

2.3.2. DEMOLITION

Demolition shall include removal of all structures, foundations, pavements, and utilities, and clear and grubbing. All refuse and debris shall be disposed of off site. Holes and depressions shall be backfilled. Fill materials shall be composed of satisfactory soils or aggregates defined in ASTM D 2487 as GW, GP, GM, SP, SM, SW, CL-ML. Minimum soil compaction shall be 95 percent of maximum density as defined in ASTM D 1557.

2.3.3. GRADING AND DRAINAGE

The contractor will provide all necessary site grading to insure adequate drainage so that no areas will be flooded due to a rainfall of a 10-year frequency. Drainage of the area shall be compatible with the existing terrain. Building floor elevation shall be a minimum 150mm above grade and slope away from the building on all sides at a minimum of 5% for 3 meters.

Because the construction of the facilities shall take place during the winter months, where snow and rain can hinder compaction efforts, the Contractor shall be prepared to make extra effort to achieve proper compaction for all sites (K-Spans, parking area and bathroom facilities). Extra effort could involve the use of various soil stabilization methods, including: chemical stabilization (i.e. Lime); incorporating additional aggregate with the soil; removing soil and replacing with aggregate; or other methods.

2.3.4. PAVING

2.3.4.1. Driveway

Paved driveways are required for access to the warehouses at the NMAA site. Driveways shall be of

wearing surface 7.3 meters (24 feet) wide, unless otherwise noted, graded for proper drainage, provided with necessary drainage structures and completed with prescribed surfaces in accordance with applicable sections of TM 5-822-2 and TM 5-822-5 standards. The driveway cross-sections shall have 200mm (8 inches) compacted aggregate base course minimum and shall be surfaced with minimum 50 mm (2 inches) hot mix asphalt concrete, unless otherwise noted. Subgrade shall be 300mm (12 inches) minimum depth scarified and compacted to 95% proctor density. Aggregate base course shall be compacted to 100% proctor density. Aggregate base course material must be well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction. Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557or equivalent DIN, BS, or EN standards.

Contractor shall notify the Contracting Officer immediately if initial site survey determines that area hydrology requires major drainage structures or bridges. Also, the Contracting Officer shall be immediately notified if the required lengths of road or preexisting conditions are determined to be substantially or materially different than the above-described conditions/estimates.

2.3.4.2. Parking Areas (Motor Pool) and Bathroom Facilities

Contractor shall construct the parking area and bathroom facility sites using aggregate surface. Subgrade shall be 150mm (6 inches) minimum in depth scarified and compacted to 95% proctor density. Aggregate base shall be 150mm (6 inches) in depth and compacted to 100% proctor density. Aggregate Base Course (ABC) material must be well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction. Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557or equivalent DIN, BS, or EN standards.

2.3.5. GATES AND FENCE:

2.3.5.1. Fencing shall be a minimum 2.4 m high from the top of the fence to the top of the ground. Fence and gate fabric shall be No. 9 gage wires woven into a 50 mm diamond mesh. Fabric shall be coated with 366 grams per square meter zinc galvanizing. Posts shall be ASTM F 1083 Pipe, Steel, Hot Dipped Zinc Coated (Galvanized) Welded or equal. Post sizes shall be as shown on drawings. The gates shall be swing type. Vehicle gates shall be a pair of 3.65 m wide x 2.4 m high leafs, constructed of a steel tube frame and steel tube intermediate posts and rails. The design of the gates shall insure that it is dimensionally stable, square, true and planar. Gate leafs shall not rack or deflect when installed on its hinges. Gates shall have a sufficient number of hinges to support each gate leaf. Provide a locking mechanism that holds the gates together when in the closed position as well as a drop bolt that engages a steel sleeve embedded in the pavement.

2.3.5.2. Reinforced Barbed Tape: Reinforced barbed tape shall be 600 mm diameter concertina style coil consisting of 31 loops. Each loop shall consist of 19 barb clusters per loop. Adjacent coils loops shall be alternately clipped together at three points about the circumference to produce the concertina effect upon deployment. Spacing between attachments points when deployed shall be 400 mm. The reinforced barbed tape shall be fabricated from 430 series stainless steel with hardness range of Rockwell (30N) 37-45 conforming to the requirements of ASTM A 176. Each barb shall be a minimum of 30.5 mm (1.2 inch) in length, in groups of 4, spaced on 102 mm (4 inch) centers. The stainless steel core wire shall have a 2.5 mm (0.098 inch) diameter with a minimum tensile strength of 895 MPa. Sixteen gauge stainless steel twistable wire ties shall be used for attaching the barbed tape to the barbed wire. The reinforced barbed tape shall be equivalent to NSN: 5660-01-457-9852.

2.3.5.3. Outriggers: Outrigger supporting arms shall be “Y” shaped. Posts shall conform to ASTM F 1083, Pipe, Steel, Hot Dipped Zinc Coated (Galvanized) Welded.

2.3.6. CIVIL UTILITIES

2.3.6.1. General

The design of the water and sanitary systems shall be sized to provide flow and discharge based on a fixture unit basis. The design drawings shall show all utility lines, line sizes, valves, manholes, and applicable details associated with water and sanitary system designs. Specifications covering water lines, valves, pumps, controls, sanitary sewers and storm sewers shall be submitted as part of the design and shall require standard materials that are available in-country. Contractor shall install and connect exterior sanitary sewer collection and water supply piping to service connection points of each facility requiring such.

2.3.6.2. Water

2.3.6.2.1. General Water: Infrastructure design and construction shall serve the demand. The Contractor shall install branches, laterals, lines and service connections to include all pipe, valves, fittings and appurtenances. Exterior water line construction shall include service to all buildings as described in the Scope of Work Section 01010.

2.3.6.3. Water Distribution System

2.3.6.3.1. General: The Contractor shall provide a water distribution system described as follows: Pipe diameters used in the network shall be 300mm (12 inch), 250mm (10 inch), 200mm (8 inch), 150mm (6 inch) and 100mm (4 inch), as calculated, using ductile iron (DI) conforming to AWWA C151, installed in accordance with C 600 or polyvinyl chloride (PVC) as per ASTM D 1784 and 1785. All pipes and joints shall be capable of at least 1.03 Mpa (150 psi) and 1.38 (200psi) hydrostatic test pressure unless otherwise specified. Pipes should be adequate to carry the maximum quantity of water at acceptable velocities 0.9 to 1.5m/sec (3 to 5 ft/sec) at maximum flows not to exceed 2.8m/sec (9.2ft/sec) with working pressures of 275kPa (40psi) to 517kPa (75psi). **Minimum pressure shall be 207kPa (30psi)** to all points of the distribution system except that **Minimum pressure shall be 140kPa (20 psi)** when fire protection is used and **maximum pressure of 690kPa (100psi)** can be allowed in small, low-lying areas not subject to high flow rates and surge pressures. If high pressures (greater than 690kPa) cannot be avoided, pressure-reducing valves shall be used. Water service connections to buildings shall vary from 19mm, 25mm or 38mm to 75mm, as calculated, depending on the usage requirement. Pipe service connections from the distribution main to the building shall be either Polyvinyl Chloride (PVC) plastic Schedule 80 ASTM D 1785 or copper tubing conforming to ASTM B 88M, Type K, annealed. After choosing piping material type, use similar piping materials for all buildings for efficiency of future maintenance activities. The distribution network shall be laid out in a combination grid and looped pattern with dead ends not exceeding 30m (99 feet). Dead end sections shall not be less than 150mm (6 inch) diameter and shall either have blow off valves or fire hydrants (flushing valves) installed for periodic flushing of the line. Any pipe with a fire hydrant on the line shall be at least 150mm (6 inch) in diameter. Water supply distribution shall connect to a building service at a point approximately 1.5m (5 feet) outside the building or structure to which the service is required. Adequate cover must be provided for frost protection. A minimum cover of 800mm (2'-8") is required to protect the water distribution system against freezing. Water lines less than 1.25 meters (4 feet) deep under road crossings shall have a reinforced concrete cover of at least 150 mm (6 inch) thickness around the pipe.

2.3.6.3.2. Pipe: The Contractor shall provide pipe of adequate strength, durability and be corrosion resistant with no adverse effect on water quality. The exterior surface of the pipe must be corrosion resistant. If the pipe is installed underground pipe shall be encased with polyethylene in accordance with AWWA C105. Water distribution pipe material shall be PVC or Ductile Iron (DI). Ductile iron pipe shall conform to AWWA C104, etal. DI fittings shall be suitable for 1.03MPa (150psi) pressure unless otherwise specified. Fittings for mechanical joint pipe shall conform to AWWA C110. Fittings for use with push-on joint pipe shall conform to AWWA C110 and C111. Fittings and specials shall be cement mortar lined (standard thickness) in accordance with C104. Polyvinyl Chloride (PVC) pipe shall conform to ASTM D 1785. Plastic pipe coupling and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B. PVC screw joint shall be in accordance with ASTM D 1785, etal, Schedules 40, 80 and 120. PVC pipe couplings and fittings shall be manufactured of

material conforming to ASTM D 1784, Class 12454B. Pipe less than 80mm (3 inch) , screw joint, shall conform to dimensional requirements of ASTM D schedule 80. Elastomeric gasket-joint, shall conform to dimensional requirements of ASTM D 1785 Schedule 40, All pipe and joints shall be capable of 1.03 Mpa (150psi) working pressure and 1.38 Mpa (200psi) hydrostatic test pressure.

2.3.6.3.3. Hydrostatic, Leakage and Disinfection tests: The Contracting Officer will be notified not less than 48 hours in advance of any water piping test and will be given full access for monitoring testing procedures and results. Where any section of water line is provided with concrete thrust blocking for fittings or hydrants tests shall not be made until at least 5 days after installation of the concrete thrust blocking, unless otherwise approved.

2.3.6.3.4. Pressure Test: After the pipe is laid, the joints completed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of piping shall, unless otherwise specified, be subjected for 1 hour to a hydrostatic pressure test of 1.03 MPa (150 psi). Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, hydrants and valves shall be carefully examined during the partially opened trench test. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, hydrants and valves discovered following this pressure test shall be removed and replaced and retested until the test results are satisfactory.

2.3.6.3.5. Leakage Test: Leakage test shall be conducted after the pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours and during the test the water line shall be subjected to not less than 1.03 MPa (150psi). Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section, necessary to maintain pressure to within 34.5kPa (5 psi) of the specified leakage test pressure after the pipe has been filled with water and the air expelled. Pipe installation will not be accepted if leakage exceeds the allowable leakage, which is determined by the following formula:

- L = 0.0001351ND (P raised to 0.5 power) L = Allowable leakage in gallons per hour N = Number of joints in the length of pipeline tested D = Nominal diameter of the pipe in inches P = Average test pressure during the leakage test, in psi gauge
- Should any test of pipe disclose leakage greater than that calculated by the above formula, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the government.

2.3.6.3.6. Bacteriological Disinfection

- Disinfection Procedure: Before acceptance of potable water operation, each unit of completed waterline shall be disinfected as prescribed by AWWA C651. After pressure tests have been completed, the unit to be disinfected shall be thoroughly flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material. Flushing will be performed in a manner and sequence that will prevent recontamination of pipe that has previously been disinfected. The chlorinating material shall be liquid chlorine, calcium hypochlorite, or sodium hypochlorite. The chlorinating material shall provide a dosage of not less than 50 ppm and shall be introduced into the water lines in an approved manner. Polyvinyl Chloride (PVC) pipelines shall be chlorinated using only the above-specified chlorinating material in solution. The agent shall not be introduced into the line in a dry solid state. The treated water shall be retained in the pipe long enough to destroy all non-spore forming bacteria. Except where a shorter period is approved, the retention time shall be at least 24 hours and shall produce not less than 25 ppm of free chlorine residual throughout the line at the end of the retention period. Valves on the lines being disinfected shall be opened and closed several times during the contact period. The line shall then be flushed with clean water until the residual chlorine is reduced to less than 1.0 ppm. During the flushing period, each fire hydrant on the line shall be opened and closed several times.
- Sampling: For each building connected to the water system, personnel from the Contractor's commercial laboratory shall take at least 3 water samples from different

points, approved by the Contracting Officer, in proper sterilized containers and perform a bacterial examination in accordance with approved methods. The commercial laboratory shall be verified to be qualified by the appropriate authority for examination of potable water.

- Acceptance Requirements: The disinfection shall be repeated until tests indicate the absence of pollution for at least 2 full days. The unit will not be accepted until satisfactory bacteriological results have been obtained.

2.3.6.3.7. Time for making Tests: Except for joint material setting or where concrete thrust blocks necessitate a 5-day delay, pipeline jointed with rubber gaskets, mechanical or push-on joints, or couplings may be subjected to hydrostatic pressure, inspected and tested for leakage at any time after partial completion of backfill.

2.3.6.3.8. Concurrent Tests: The Contractor may elect to conduct the hydrostatic tests using either or both of the following procedures. Regardless of the sequence of tests employed, the results of pressure tests, leakage tests, and disinfection shall be recorded for submission and approval. Replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Government. a. Pressure test and leakage test may be conducted concurrently, b. Hydrostatic tests and disinfection may be conducted concurrently, using water treated for disinfection to accomplish the hydrostatic tests. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be re-accomplished.

2.3.6.3.9. Valves: Valves (Gate valves w/box) shall be placed at all pipe network tee and cross intersections and the number of valves shall be one less than the number of lines leading into and away from the intersection. For isolation purposes valves shall be spaced not to exceed 3600 mm (12 feet). Gate valves shall be in accordance with AWWA C 500 and/or C509. Butterfly valves (rubber seated) shall be in accordance with C504 etal. The valves and valve boxes shall be constructed to allow a normal valve key to be readily used to open or close the valve. Provide traffic-rated valve boxes. Provide concrete pad, 1 meter (3’-4”) square, for all valve boxes.

2.3.6.3.10. Vacuum and Air Release Valves: Air release valves are required to evacuate air from the main high points in the line when it is filled with water, and to allow the discharge of air accumulated under pressure. Vacuum relief valves are needed to permit air to enter a line when it is being emptied of water or subjected to vacuum. Contractor shall submit manufacturer’s data for properly sized combination air and vacuum release valves and determine their locations on the distribution system subject to review and approval of the Contracting Officer.

2.3.6.3.11. Blow-Off Valves: The Contractor shall provide 40-50mm (1-5/8” – 2”) blow-off valves at ends of dead end mains. Valves should be installed at low points in the mains where the flushing water can be readily discharged to natural or manmade drainage ditches, swales or other.

2.3.6.3.12. Thrust Blocking: Contractor shall provide concrete thrust blocking at any point where the layout of the system changes the direction of the flow, increases the velocity, or decreases or stops the flow. At these points, the pipes and fittings must be anchored and kept from moving or pulling apart by the use of thrust blocks installed against undisturbed earth.

2.3.6.4. Sanitary Sewer

2.3.6.4.1. General: There are existing sanitary sewer collection, treatment and disposal facilities at this site. The Contractor shall obtain topographic information or other maps that show vegetation, drainage channels and other land surface features such as underground utilities and related structures that may influence the design and layout of the service connection line. If maps are not available, or do not provide satisfactory information or sufficient detail of the site, field surveys shall be performed. Sanitary sewers less than 1.25 meters (4 feet) under road crossings shall have reinforced concrete cover at least 150 mm (6 inch) thick around the pipe.

2.3.6.4.2. Exterior sanitary sewer line construction shall include service to all buildings as described in the Scope of Work Section 01010. Contractor shall design sanitary service connection line using approved field survey data and finished floor elevations. Depending upon the topography and building location, the most practical location of sanitary sewer lines is along one side of the street. In other cases they may be located behind buildings midway between streets. All sewers shall be located outside of the roadways as much as practical, and minimize the number of roadway crossings. To the extent practical, a sewer from one building shall not be constructed under another building, or remain in service where a building is subsequently constructed over it. Construction required shall include appurtenant structures and building sewers to points of connection with building drains 1.5m (5 feet) outside the building to which the sewer collection system is to be connected.

2.3.6.4.3. The Contractor shall use the following criteria where possible to provide a layout which is practical, economical and meets hydraulic requirements: 1) Follow slopes of natural topography, 2) avoid routing sewers through areas which require extensive restoration or underground demolition, 3) Avoid areas of high groundwater and placement of sewer below the groundwater table, 4) locate manholes at change in direction, size or slope of gravity sewers, 5) use straight sections between manholes, curved alignment shall not be permitted, 6) locate manholes at intersections of streets where possible, 7) avoid placing manholes where the tops will be submerged or subject to surface water inflow, 8) evaluate alternative sewer routes where applicable, 9) verify that final routing selected is the most cost effective alternative that meets service requirements. In the event that facilities to be provided under the contract must be occupied prior to completion of permanent wastewater infrastructure, the Contractor will be responsible for providing temporary portable shower and bathroom facilities.

2.3.6.4.4. Protection of Water Supplies

- The Contractor shall ensure that the sewer design meets the following criteria:
- Sanitary sewers shall be located no closer than 15m (50 feet) horizontally to water wells or reservoirs to be used for potable water supply.
- Sanitary sewers shall be no closer than 3 m (10 feet) horizontally to potable water lines; where the bottom of the water pipe will be at least 300mm (12 inches) above the top of the sanitary sewer, horizontal spacing shall be a minimum of 1.8 m (6 feet).
- Sanitary sewers crossing above potable water lines shall be constructed of suitable pressure pipe or fully encased in concrete for a distance of 2.7m (9 feet) on each side of the crossing. Pressure pipe will be as required for force mains in accordance with local standards and shall have no joint closer than 1 meter (3 feet) horizontally to the crossing, unless the joint is encased in concrete.

2.3.6.4.5. Gravity Sewer: Sanitary sewers shall be designed to flow at 70 percent full. Sanitary sewer velocities shall be designed to provide a minimum velocity of 0.6 meters per second (mps) or 2.0 feet per second (fps) at the ADD flow rate and a minimum velocity of 0.8 to 1.05 mps (2.5-3.5fps) at the peak diurnal flow rate. In no case shall the velocity drop below 0.3 mps, (1.0 fps) to prevent settlement of organic solids suspended in the wastewater. Pipe slopes shall be sufficient to provide the required minimum velocities and depths of cover on the pipe. Unless otherwise indicated (see Building Connections and Service Lines), gravity sewer pipe shall be installed in straight and true runs in between manholes with constant slope and direction. Adequate cover must be provided for frost protection. A minimum cover of 800 mm (2’-8”) will be required to protect the sewer against freezing.

2.3.6.4.6. Manholes:The Contractor shall provide standard depth manholes (MH), (depth may vary) an inside dimension of 1.2 meters (4 feet). Manholes shall be made of cast-in-place reinforced concrete with reinforced concrete cover. Alternate precast manhole option shall taper to a 750 mm (30-inch) cast iron frame that provides a minimum clear opening of 600 mm (24 inches). In every case, the manholes, frames and covers shall be traffic rated, H-20 load rating. All manholes shall be provided with a concrete bench with a flow line trough, smoothly formed to guide waste flow to the outlet pipe from the inlet pipe(s). The top surface of the

bench shall be above the crown of all pipes within the manhole. All surfaces of the bench shall be sloped smoothly toward the trough to guide flow, even under peak flow conditions.

- Manhole Design Requirements: Manholes are required at junctions of gravity sewers and at each change in pipe direction, size or slope, except as noted hereinafter for building connections.
- Spacing: The distance between manholes must not exceed 120 m (400 ft) in sewers of less than 460 mm (18 inches) in diameter. For sewers 460 mm (18 inches) and larger, and for outfalls from wastewater treatment facilities, a spacing of up to 180 m (600 ft) is allowed provided the velocity is sufficient to prevent the sedimentation of solids.
- Pipe Connections: The crown of the outlet pipe from a manhole shall be on line with or below the crown of the inlet pipe.
- Frames and Covers: Frames and covers shall be cast iron, ductile iron or reinforced concrete, traffic rated in any case to an H-20 load rating. Cast iron frames and covers shall be traffic rated, circular with vent holes.
- Steps for Manholes: Steps shall be cast iron, polyethylene coated, at least 15 mm (5/8 inch) thick, not less than 400mm (16 inches) in width, spaced 300 mm (12 inches) on center.

2.3.6.4.7. Pipe: Pipe shall conform to the respective specifications and other requirements as follows: Provide Polyvinyl Vinyl Chloride (PVC) conforming to ASTM D 3034, Type PSM with a maximum SDR of 35, size 380 mm (15inch) or less in diameter. PVC shall be certified as meeting the requirements of ASTM D 1784, cell Class 12454 B.

- Fittings: Fittings shall be compatible with pipe supplied and shall have a strength not less than that of the pipe. Fittings shall conform to the respective specifications and requirements as follows: provide PVC fittings conforming to ASTM D 3034 for type PSM pipe.
- Joints: Joints installation requirements shall comply with the manufacturers installation instructions. Flexible plastic pipe (PVC or high density polyethylene pipe) gasketed joints shall conform to ASTM D3212.
- Branch Connections: Branch connections shall be made by use of regular fittings or solvent-cemented saddles as approved. Saddles for PVC pipe shall conform to Table 4 of ASTM D 3034.
- The minimum depth of the cover over the pipe crown shall be 0.8m (2’-8”).

2.3.6.4.8. Cleanouts: Cleanouts must be installed on all sewer-building connections to provide a means for inserting cleaning rods into the underground pipe. Install manufactured wye fittings. In lieu of a wye fitting, an inspection chamber may be installed. The inspection chamber shall be of the same construction as a manhole. Preferably the cleanout will be of the same diameter as the building sewer, and never be smaller than 100 mm (4 inch).

2.3.6.4.9. Building Connections and Service Lines: Building connections and service lines will be planned to eliminate as many bends as practical and provide convenience in rodding. Bends greater than 45 degrees made with one fitting should be avoided; combinations of elbows such as 45-45 or 30-60 degrees should be used with a cleanout provided. Connections to other sewers will be made directly to the pipe with standard fittings rather than through manholes. However, a manhole must be used if the connection is more than 31m from the building cleanout. Cleanouts shall be provided outside of the building. Service connection lines and laterals lines shall be a minimum of 150 mm (6 inch) diameter and sloped to maintain the minimum velocity as described in paragraph “Gravity Sewer.”

2.3.6.4.10. Field Quality Control

Field Tests and Inspections

- The Contracting Officer will conduct field inspections and witness field tests specified in this section. The Contractor shall perform field tests and provide labor, equipment and incidentals required for testing.
- Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically a full circle of light through the pipeline when viewed from the

adjoining end of the line. When pressure piping is used in a non-pressure line for non-pressure use, test this piping as specified for non-pressure pipe.

- Test lines for leakage by either infiltration tests or exfiltration tests. Prior to testing for leakage, backfill trench up to at least lower half of the pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe to prevent movement during testing, but leaving joints uncovered to permit inspection. When leakage or pressure drop exceeds the allowable amount specified, make satisfactory correction and retest pipeline section in the same manner. Correct visible leaks regardless of leakage test results.
- Infiltration tests and ex-filtration tests: Perform these tests for sewer lines made of specified material, not only concrete, in accordance with ASTM C 969M, ASTM C 969. Make calculations in accordance with the Appendix to ASTM C 969M, ASTM 969.
- Low-pressure air tests: Perform tests as follows: 1) Concrete pipe: Test in accordance with ASTM C 924M, ASTM C 924. Allowable pressure drop shall be given in ASTM C 924M ASTM C 924. Make calculations in accordance with the Appendix to ASTM C 924M, ASTM C 924; 2) Ductile-iron pipe: Test in accordance with the applicable requirements of ASTM C 924M, ASTM C 924. Allowable pressure drop shall be as given in ASTM C 924M, ASTM C 924. Make calculations in accordance with the Appendix to ASTM C 924M, ASTM C 924; 3) PVC Plastic pipe: Test in accordance with applicable requirements of UBPPA UNI-B-6. Allowable pressure drop shall be as given in UBPPA UNI-B-6. Make calculations in accordance with the Appendix to UBPPA UNI-B-6.

2.3.6.4.11. Deflection Testing: Deflection testing will not be required however, field quality control shall ensure that all piping is installed in accordance with deflection requirements established by the manufacturer.

2.3.6.5. Storm Sewer Systems

Oil/water separators shall be utilized for all drains from industrial sites. Separators shall be installed as close as possible from the drain location. Storm sewer system shall not be mixed with sanitary sewer system and shall be in accordance with UFC 3-240-03, reference latest edition.

3. ARCHITECTURAL REQUIREMENTS

3.1. GENERAL

All material approved shall become standardized material to be used throughout the facilities under contract. Different sub-contractors shall not use different material or standards under the contract. Intent of the project is to use locally procured materials (unless specified otherwise) and labor to the maximum extent possible while satisfying seismic building code. Conflicts between criteria shall be brought to the attention of the Contracting Officer for resolution. In such instances, the Contractor shall furnish all available information with justification to the Contracting Officer.

3.2. DESIGN CRITERIA

The Codes, Standards, and Regulations listed herein shall be used in the construction of this project. The publications shall be the [referenced [most recent] editions. Standards other than those mentioned may be accepted provided they meet the minimum requirements and the contractor shall submit proof of equivalency to the Contracting Officer for approval.

IBC- International Building Code
NFPA-101- National Fire Protection Association, Life Safety Code.

3.3. LIFE SAFETY/ FIRE PROTECTION/ HANDICAPPED ACCESSIBILITY

To the extent possible, all facilities will be designed in accordance with recognized industry standards for life safety and building egress. An adequate fire alarm system, fire extinguishers, and smoke alarms shall all be included as required. If a sprinkler system is required by building code, a waiver will have to be obtained before construction notice to proceed is issued. However, due to the lack of adequate water

volume and pressure, sprinkler systems may not be feasible. The facility shall comply with all other safety requirements of NFPA 101. In keeping with the intended function of these facilities, handicapped accessibility will not be incorporated into this project. Due to the war contingency requirement, it is assumed that only able-bodied military and civilian personnel will use the facilities listed herein.

3.4. ANTITERRORISM/ FORCE PROTECTION

Force protection/anti-terrorism measures for this location shall be followed and incorporated into this project in accordance with the referenced DoD Regulations. Information regarding force protection may be found herein and at the following link: www.tisp.org/files/pdf/dodstandards.pdf .

3.5. EXCAVATION

Trench excavation shall be made for concrete footings. Trenches shall be a minimum of .8 meter deep. Trenches deeper than 1.5 meters shall have protective shoring to protect workers or have the sides of the trench sloped back at a slope of 1.5:1. Care shall be taken when backfilling of foundation trenches to avoid damage to walls. Any excess dirt shall become the property of the Contractor and shall be removed from the site to a location approved by the Contracting Officer.

3.6. CONCRETE

3.6.1. Place 150 mm (6”) of capillary water barrier below areas to receive a concrete slab on properly compacted soil free of organic material. A plastic vapor barrier (10 mils thick) shall be placed over the crushed stone prior to placing of concrete slabs. Concrete flooring in wet areas shall slope to the floor drain and not allow for water to puddle. Concrete slabs in all areas shall not be placed prior to inspection and approval of piping and sub-surface by the Contracting Officer. Foundation trenches shall be level and free of loose material. Trenches shall be inspected and approved by the Contracting Officer prior to placing of any concrete foundations.

3.7. MASONRY

3.7.1. Storage of masonry materials shall be in a dry place or materials shall be covered with a plastic protective layer. Cover open walls each day to keep them protected and dry. Concrete masonry units (CMU) for exterior walls shall be either 200 mm or 300 mm wide x 400 mm x 200 mm high as shown on drawings. All cells shall be fully grouted in exterior walls. They shall be installed in running bond level and plumb. Mortar joints shall be 9 mm on all sides between CMU. Joints shall be struck with a concave tool to provide a smooth recessed curved surface. Install only quality units. The surface shall be free of chips, cracks, or other imperfections that would detract from the overall appearance of the finished wall. Defective CMU or mortar shall be rejected.

3.8. METAL

3.8.1. METAL WINDOW SILLS

Galvanized metal window sills, 1 mm (20 gage), shall be installed on the exterior of all windows. The metal window sills shall have a turn down of 50 mm over the exterior masonry and stucco. Metal sills shall extend from side to side of the masonry opening in a single piece. Extend the metal windowsill a minimum of 20 mm under the bottom of the aluminum windows. Install masonry mortar as required for a smooth surface under the window sills. Sills shall slope a minimum of 6mm to the exterior and not allow water to puddle.

3.9. WEATHER & THERMAL PROTECTION

3.9.1. SEALANT

As required for each Substrate and adjoining Materials.

3.10. DOORS, WINDOWS & HARDWARES

3.10.1. DOORS

3.10.1.1. All exterior doors (entry and exit doors) shall be heavy duty metal doors with metal frames. Interior door shall be hollow metal doors with hollow metal frames. All exterior doors shall be 44.5 mm hollow metal 1.30 mm (18 gauge) steel with rigid foam core insulation. Hollow metal frames shall be 1.30 mm (18 gauge) steel and comply with ASTM A-366 cold rolled 3-piece knock down or equal Steel doors, frames, and steel glazing frames shall be painted to match factory finish off-white window frames. Doors shall be 900 mm wide X 2100 mm high.

3.10.1.2. Steel Doors: SDI A250.8, except as specified otherwise. Prepare doors to receive specified hardware. Undercut where indicated. Exterior doors shall have top edge closed flush and sealed to prevent water intrusion.

3.10.2. DOOR ACCESSORIES

Provide completed Moldings and accessories required for the swing and close of doors.

3.10.3. STANDARD STEEL FRAMES

3.10.3.1. SDI A250.8, except as otherwise specified. Form frames to sizes and shapes indicated, with welded corners or knock-down field-assembled corners. Provide steel frames for doors, transoms, sidelights, mullions, cased openings, and interior glazed panels, unless otherwise indicated.

3.10.3.2. Welded Frames: Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth.

3.10.3.3. Mullions and Transom Bars: Mullions and transom bars shall be closed or tubular construction and shall member with heads and jambs butt-welded thereto or knock-down for field assembly. Bottom of door mullions shall have adjustable floor anchors and spreader connections.

3.10.3.4. Stops and Beads: Form stops and beads from 0.9 mm thick steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval-head, countersunk Phillips self-tapping sheet metal screws or concealed clips and fasteners. Space fasteners approximately 300 to 400 mm on centers. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

3.10.4. ANCHORS:

3.10.4.1. Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated or painted with rust-inhibitive paint, anchors not lighter than 1.2 mm thick.

3.10.4.2. Wall Anchors: Provide at least three anchors for each jamb. For frames which are more than 2285 mm in height, provide one additional anchor for each jamb for each additional 760 mm or fraction thereof.

3.10.4.3. Masonry: Provide anchors of corrugated or perforated steel straps or 5 mm diameter steel wire, adjustable or T-shaped.

3.10.4.4. Existing openings: Secure frames to previously placed concrete or masonry with expansion bolts

3.10.4.5. Floor Anchors: Provide floor anchors drilled for 10 mm anchor bolts at bottom of each jamb member. Where floor fill occurs, terminate bottom of frames at the indicated finished floor levels and support by adjustable extension clips resting on and anchored to the structural slabs.

3.10.5. HARDWARE PREPARATION

Provide minimum hardware reinforcing gages as specified in ANSI A250.6. Drill and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of SDI A250.8 and ANSI A250.6. For additional requirements refer to BHMA A115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Locate hardware in accordance with the requirements of SDI A250.8, as applicable. Punch door frames, with the exception of frames that will have weather-stripping or lightproof or soundproof casketing, to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

3.10.6. HARDWARE FOR STANDARD DOORS

3.10.6.1. Hinges: Exterior hinges shall have non-removable pins and be satin-chrome steel or stainless steel; Grade 1 anti-friction or ball bearing; and 3 each of 115 mm x 115 mm per leaf up to 900 mm wide door 125 mm x 125 mm for doors 900 mm to 1.200 mm wide. Interior hinges shall be Grade 1; antifriction or ball bearing; and 3 each of 115 mm x 115 mm per leaf up to 900 mm wide door 125 mm x 125 mm for doors 900 mm to 1200mm wide Hinges for labeled fire doors must be either steel or stainless steel. Hinges shall conform to ANSI/BHMA A156.1 and A156.7. Locksets, Latchets, Exit Devices, and Push and Pull Plates: Exterior doors shall have mortise locks conforming to ANSI/BHMA A156.13 for metal doors. Emergency exit devices shall be Grade 1, flush mounted type. Interior doors shall have mortise locksets conforming to ANSI/BHMA A156.13, Series1000, Grade 1. All locks and latchsets shall be the product of the same manufacturer. Locksets, padlocks and latchsets shall be provided, as required, with lever handles on each side. Provide heavy duty hasp and locks at all fuel storage tanks.

3.10.6.2. Closers: Closers shall be provided on all exterior doors and fire-rated doors. All exterior Doors and Interior Doors that require Security or Privacy such Conference Room as Toilet Room or Shower Room must have Heavy-duty Hydraulic Closer.

3.10.6.3. Closers shall conform to ANSI/BHMA A156.4, Grade 1. Closers shall be surface-mounted, modern type, with cover. Closer must be adjustable type and has slow-down control to prevent Door Leaf from slamming to Frame and become nuisance to tenant.

3.10.6.4. Provide Door Silencers to all doors with Closers.

3.10.6.5. Cylinders: Lock cylinders shall comply with BHMA A156.5. Lock cylinder shall have six pins. Cylinders shall have key removable type cores. All locksets, exit devices, and padlocks shall accept same interchangeable cores.

3.10.6.6. Thresholds: All exterior doors (except Mech/Elect rooms) shall be provided with aluminum thresholds conforming to ANSI/BHMA A156.21. Doors at ceramic tile flooring shall be provided with marble thresholds and set marble threshold 13 mm above tile at all wet areas.

3.10.6.7. Door Stops: Doorstops shall be provided on all exterior and interior doors. Doorstops shall comply with ANSI/BHMA A156.16 and shall be satin chrome on bronze, Grade 1.

3.10.6.8. All Hardware required for exiting, etc. shall be per NFPA and applicable Codes for exiting and shall comply with ANSI/BHMA and finishes. Provide Panic Hardware (Push-bar) for all Egress Door.

3.10.6.9. Master Keying: All submittals/shop drawings referring to keys and keying shall be submitted to engineering for evaluation. A key cabinet shall be provided with a capacity 50% greater than the number of key changes used for door locks. Location of Key cabinet shall as directed by Contracting Officer. Lock cylinder shall have not less than six (6) pins “Small Format Interchangeable Core (SFIC)" manufactured by Best Lock Company. A grand master

keying system shall be provided from the factory. Locks shall be keyed in sets or subsets based on building groups as indicated in Section 01010 and submitted to for evaluation to engineering. Keys shall be supplied as follows:

- Locks: 3 change keys each lock
- Master keyed sets: 3 keys each set
- Grand Master keys: 10 total

3.10.7. FABRICATION AND WORKMANSHIP

3.10.7.1. Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction indicated. Corner joints shall be well formed and in true alignment. Conceal fastenings where practicable. On wraparound frames for masonry partitions, provide a throat opening 3 mm larger than the actual masonry thickness. Design other frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to receive calking compound.

3.10.7.2. Grouted Frames: For frames to be installed in exterior walls and to be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.

3.10.8. INSTALLATION

3.10.8.1. Frames: Set frames in accordance with SDI 105. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners. Build in or secure wall anchors to adjoining construction. Backfill frames with mortar. When an additive is provided in the mortar, coat inside of frames with corrosion-inhibiting bituminous material. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.

3.10.8.2. Doors: Hang doors in accordance with clearances specified in SDI A250.8. After erection and glazing, clean and adjust hardware.

3.10.8.3. Fire and Smoke Doors and Frames: Install fire doors and frames, including hardware, in accordance with NFPA 80.

3.10.8.4. Protection and Cleaning: Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is removed. Clean thoroughly. Apply an all-over coat of rust-inhibitive paint of the same type used for shop coat. Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

3.10.9. FINISHES

All surfaces of doors and frames shall be thoroughly cleaned, chemically treated and factory primed with a rust inhibiting coating as specified in SDI A250.8, or paintable A25 galvannealed steel without primer. Where coating is removed by welding, apply touchup of factory primer.

3.11. WINDOWS & GLAZING

3.11.1. WINDOWS

3.11.1.1. Materials

3.11.1.1.1. Aluminum Extrusions: Provide alloy and temper recommended by the window

3.11.1.1.2. manufacturer for the strength, corrosion resistance, and application of required finish, meeting the DIN 1725 raw material requirements, but not less than 215 N/mm2 ultimate tensile strength and not less than 1.5 mm thick at any location for main frame and sash members.

3.11.1.1.3. Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.

- Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125 inch thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard non-corrosive pressed-in splined grommet nuts.
- Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match the finish of the member or hardware being fastened, as appropriate.

3.11.1.1.4. Anchors, Clips, and Window Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with the requirements of DIN 1748; provide sufficient strength to withstand design pressure indicated. As a minimum provide 3 anchors on each side of the frame.

3.11.1.1.5. Compression-Type Glazing Strips and Weatherstripping: Unless otherwise indicated, and at the manufacturer's option, provide compressible stripping for glazing and weatherstripping such as molded EPDM or neoprene gaskets.

3.11.1.1.6. Sealant: For sealants required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic non-shrinking, and non-migrating. Comply with Sealants of these specifications for selection and installation of sealants.

3.11.1.1.7. Wire Fabric Insect Screen shall be permanently fixed to the exterior, except for guard towers.

3.11.1.2. Hardware: Provide the manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum and of sufficient strength to perform the function for which it is intended.

3.11.1.3. Fixed, Casement, Projected and Horizontal Sliding Windows

3.11.1.3.1. Provide window units meeting UL 752, level 5, but no less than 16 mm laminated single glazed. This standard shall apply to all window units within guard shack, guard house, guard tower, and guard rooms in Headquarters Building. Provide cam action sweep sash lock and keeper at meeting rails. All other glazing shall be minimum 5mm laminated single glazed.

3.11.1.3.2. Fabrication:

- Provide horizontally sliding aluminum windows with factory finish in all buildings to fit the masonry openings. Window openings shall be provided with insect screening permanently fixed to the
- exterior. Provide a locking device on the interior of each window. Provide anchors on each side of the frame into the adjoining masonry, 3 on each side. Provide weather stripping system for all exterior windows and doors.

3.11.1.3.3. Finishes: Apply baked enamel in compliance with paint manufacturer's specifications for cleaning, conversion coating, and painting.

- Color: White meeting the requirements of DIN 50018

3.11.1.3.4. Inspection: Inspect openings before beginning installation. Verify that rough or masonry opening is correct and the sill plate is level. Masonry surfaces shall be visibly dry and free of excess mortar, sand, and other construction debris.

3.11.1.3.5. Installation: Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of the work. Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place. Set sill members and other members in a bed of compound or with joint fillers or gaskets, as shown, to provide weathertight construction. Refer to the Sealant sections for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the work.

3.11.1.3.6. Adjusting: Adjust operating sash and hardware to provide a tight fit at contact points and at weatherstripping for smooth operation and a weathertight closure.

3.11.1.3.7. Cleaning: Clean aluminum surfaces promptly after installation of windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

3.11.2. LOUVERS

3.11.2.1. Exterior Louvers: Louvers shall be inverted "Y", "V" or "Z" type. Weld or tenon louver blades to continuous channel frame and weld assembly to door to form watertight assembly. Form louvers of hot-dip galvanized steel of same gage as door facings. Louvers shall have steel-framed insect screens secured to room side and readily removable. Provide aluminum wire cloth, 7 by 7 per 10 mm or 7 by 6 per 10 mm mesh, for insect screens.

3.11.2.2. Louver of K-Span warehouse shall be Operable Louver that can be fully open and close from a Control Switch inside Warehouse (per direction of COR). Louver shall also have interlock Mechanism the works in conjunction with HVAC system.

3.12. FINISHES

3.12.1. EXTERIOR & INTERIOR FINISHES

3.12.1.1. Painting and Coating: The first coat shall be a scratch coat approximately 1 cm thick. Allow 7 days to cure. The second coat shall be finish plaster, smooth finish, approximately 1 cm thick. Allow 7 days to cure before painting. Stucco showing over sanding, cracks, blisters, pits, checks, discoloration or other defects is not acceptable. Defective plaster work shall be removed and replaced with new plaster at the expense of the Contractor. Patching of defective work will be permitted only when approved by the Contracting Officer. All exterior color finish shall be integral with the stucco finish. No painted stucco shall be permitted due to minimize future maintenance. Color to be selected by the Contracting Officer from the color board provided by the Contractor.

3.12.1.1.1. Paints shall contain less than 0.06% lead by weight.

3.12.1.1.2. Paint all exposed fascia, soffit, and doors with 2 coats of gloss enamel, white.

3.12.1.1.3. Exposed exterior steel trim, frames, doors and pipe railings: Paint with one coat oil-based primer, with 2 coats of oil-based alkyd gloss enamel, color to be selected by the Contracting Officer from the color board provided by the Contractor.

3.12.1.2. Ceramic Tile: Tile work shall not be performed unless the substrate and ambient temperature is at least 10 degrees C and rising. Temperature shall be maintained above 10 degrees C while the work is being performed and for at least 7 days after completion of work. Upon completion, tile surfaces shall be thoroughly cleaned in accordance with manufacturer’s approved cleaning instructions. Acid shall not be used for cleaning glazed tile. Floor tile with resinous grout or with factory mixed grout shall be cleaned in accordance with instructions of the grout manufacturer. After the grout has set, tile wall surfaces shall be given a protective coat of a non-corrosive soap or other approved method of protection.

3.12.1.3. Terrazzo Tile: Shall be 300 mm x 300 mm terrazzo tile with thin set mortar. Joints shall be 2-3 mm. Waterproof gray grout shall be applied the full depth of the tile. Color of tile shall be

selected by the Contracting Officer from samples provided by the Contractor.

3.12.1.4. All high traffic areas shall be completely cleaned and sealed epoxy. Color to be selected by the Contracting Officer from samples provided by the Contractor.

3.13. SPECIALTIES

All Specialties and Accessories as shown on drawings or Appendix shall be heavy duty type. Secure to base building with Heavy-duty, Tamper-proof Screws or Anchor-bolts.

4. STRUCTURAL

4.1. STANDARDS

The Contractor shall use the following American standards to provide sound structural design. The Contractor shall follow American Concrete Institute Standards for design and installation of all concrete structures.

Warehouse Slabs on Grade:	28 MPa (4000 psi) a minimum specified compressive strength @ 28 days, (f'_c) (ASTM-. C 31M)
Foundations and Walls:	21 MPa (3000 psi) a minimum specified compressive strength @ 28 days, (f'_c) (ASTM-. C 31M)
Steel Reinforcement:	4218.0 kg./sq.cm, (F_y= 60.0 ksi) yield strength.
Anchor Bolts:	ASTM A307 using A36 steel.
Concrete Masonry Units:	ASTM C90, Type I (normal wt, Moisture Control). Mortar: ASTM C270, Type S (Ultimate compressive strength of 130.0 kg/sq. cm.) Proportion: 1 part cement, 0-1/2 part lime and 4-1/2 parts aggregate Grout: ASTM C476 (Slump between 200 mm to 250 and Compressive Strength 14 MPa (2000 psi) at 28 days.
Structural Steel ASTM A36:	2530.0 kg./sq.cm (F_y = 36,000psi) Welding: AWS (American Welding Society) D1.1-2002.

4.2. GENERAL

The project consists of various structures. The new buildings shall be provided with a reinforced concrete slab foundation that is properly placed on a suitable compacted ground area and shall be in accordance with the recommendations from the geotechnical investigation. The reinforced concrete foundation shall be designed by the Contractor. Building foundations shall be founded a minimum of 800 mm below grade.

4.3. DESIGN

Design shall be performed and design documents signed by a registered professional architect and/or engineer. Calculations shall be in SI (metric) units of measurements. All components of the building shall be designed and constructed to support safely all loads without exceeding the allowable stress for the materials of construction in the structural members and connections. Coordination between the designer of the K-span roof system and the designer of the wall and foundation systems shall be established to ensure that the transfer of all loading between the systems is safely accounted for. All building exterior walls shall be constructed with reinforced CMU, shotcrete 3-D panels, or reinforced concrete unless otherwise stated in sections 1010 or 1015.

4.4. DEAD AND LIVE LOADS

Dead loads consist of the weight of all materials of construction incorporated in the buildings. Live loads used for design shall be in accordance with the Structural Load Data, UFC 3-310-01, Unified Facilities Criteria, May 25, 2005. Floor slabs for the warehouse structures at the NMAA facility shall be designed to accommodate a 7 ton military vehiclular loading.

4.5. WIND LOADS

Wind loads shall be calculated in accordance with ASCE 7 using a "3-second gust" wind speed of 137 km/hr.

4.6. STRUCTURAL CONCRETE

Concrete structural elements shall be designed and constructed in accordance with the provisions of the American Concrete Institute, Building Code Requirements for Structural Concrete, ACI 318, latest edition. A minimum specified compressive strength at 28 days (f'_c) of 21 MPa (3000 psi) shall be used for design and construction of all concrete, except that 28 MPa (4000 psi) shall be used for the warehouse slabs on grade and shotcrete applications. Reinforcing steel shall be deformed bars conforming to American Society for Testing and Materials (ASTM) publication ASTM a 615, Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. Concrete at or below grade shall have maximum water-cement ration of 0.50. No concrete shall be placed when the ambient air temperature exceeds 32 degrees C (90 degrees F) unless an appropriate chemical retardant is used. In all cases when concrete is placed at 32 degrees C (90 degrees F) or hotter it shall be covered and kept continuously wet for a minimum of 48 hours. Concrete members at or below grade shall have a minimum concrete cover over reinforcement of 75 mm (3 inch). ACI cold weather requirements shall also be met as necessary.

4.7. CRACK CONTROL

The design and construction shall include crack control measures to minimize cracks in slabs on grade and concrete construction, such as crack control joints, expansion joints and isolation joints, as necessary. Expansion joints shall be determined and shown on the drawings.

4.8. MASONRY

Masonry shall be designed and constructed in accordance with the provisions of Building Code Requirements for Masonry Structures, ACI 530/ASCE 5/TMS 402, latest editions. Mortar shall be Type S and conform to ASTM C 270, latest edition. Masonry shall not be used below grade, unless for fully grouted and reinforced foundation stem walls. All cells of CMU walls shall be fully grouted and reinforced.

4.9. STRUCTURAL STEEL

Structural steel shall be designed and constructed in accordance with the provisions of American Institute of Steel Construction (AISC), Specifications for Structural Steel Buildings, 9th Edition. Design of cold-formed steel structural members shall be in accordance with the provisions of American Iron and Steel Institute (AISI), Specifications for Design of Cold-Formed Steel Structural Members.

4.10. K-SPAN BUILDING SYSTEM

The two warehouse type buildings to be located at the NMAA facility shall be comprised of insulated K-Span metal building roof systems supported by reinforced concrete stem walls 3.0 m in height. The floor slabs for the two structures shall be reinforced concrete with a minimum thickness of 150 mm placed on a clean vapor barrier above a capillary water barrier of 150 mm minimum thickness on properly compacted soil. Exterior walls and ceilings shall be insulated as required in the Mechanical sections of these Technical Requirements.

4.11. MODULAR CONEX UNITS

The shower and latrine temporary buildings at the Darulaman site shall be comprised of modular CONEX units. All Modular Containers shall have reinforced concrete foundations and connections designed to attach the units to each other and to their foundations. The floor slabs for these structures shall be reinforced concrete with a minimum thickness of 150 mm placed on a clean vapor barrier above a capillary water barrier of 150 mm minimum thickness on properly compacted soil. Minimum clear ceiling height shall be 2400 mm and walkways shall be a minimum of 1500 mm wide. The Contracting Officer Representative (COR) reserves the right to inspect and reject any Modular CONEX Containers not in good condition. All Modular Containers shall be inspected and accepted by Architect prior to leaving factory. See plans and these technical requirements for extent of work. Exterior walls and ceilings shall be insulated as required in the Mechanical sections of these Technical Requirements. All insulation in exterior toilet walls containing water pipes shall be rigid foam board insulation. Insulation in areas next to concrete or earth shall be rigid foam board insulation. Exterior metal Color: off white semi gloss. Doors shall be Hollow Metal and metal frame and have one (1) hour rating. All glazing shall 6mm laminate glass. The windows shall have screens and be capable of being opened from the inside. All walls shall be caulked at floor and ceiling prior to installing rubber base. All openings between rooms shall be caulked or sealed. Doors shall have seal around frames and threshold with rubber seal.

4.12. FOUNDATIONS

Foundations shall be in accordance with the Geotechnical requirements of this RFP.

5. GEOTECHNICAL

5.1. SOIL INVESTIGATION

Existing geotechnical information is not available at the project site. Any site-specific geotechnical data required to develop foundations, floor slabs, materials, earthwork, and other geotechnical related design and construction activities for this project shall be the Contractor's responsibility. The Contractor shall develop all pertinent geotechnical design and construction parameters by appropriate field and laboratory investigations and analyses. The Contractor shall produce a detailed geotechnical report containing field exploration and testing results, laboratory testing results (particle sizes and distribution, liquid and plastic limit test, and moisture and density test, etc.). Information in the report shall include, but not be limited to: existing geotechnical (e.g. surface and subsurface) conditions, location of subsurface exploration logs on site plan, exploration point, settlement analysis, amount of settlement and estimated time of occurrence, bearing capacity analysis, ultimate soil bearing capacity, allowable soil bearing capacity, foundation selection, foundation dimensions and recommendations, pavement design criteria (e.g. CBR values, modulus of subgrade reaction values, etc.), ground-water levels, and construction materials (e.g. concrete cement, asphalt, and aggregates). Foundation recommendations shall limit overall settlement to a maximum of 25 mm. Two copies of the detailed geotechnical report shall be submitted to the Contracting Officer.

5.2. SPECIALIST SUB-CONTRACTORS QUALIFICATIONS

A geotechnical engineer or geotechnical firm responsible to the Contractor shall develop all geotechnical engineering design parameters. The geotechnical engineer or geotechnical firm shall be qualified by: education in geotechnical engineering; professional registration; and a minimum of ten (10) years of experience in geotechnical engineering design.

5.2.1. HEATING & COOLING

Except for buildings with central Packaged A/C (heat-pump) Systems, and for buildings less than 250 m2, all heating and cooling shall be with Heat-Cool-Units (diesel-burner-evaporative-cooler) as shown on Drawing "ANA HEAT-COOL DESIGN-01" dated 10 Dec 06 & 24 29 Mar 07. Drawing/s shall take preference over any conflict between drawing/s and SOW/RFP

5.2.2. DUCTWORK

Air shall be distributed from central air handling unit as necessary to achieve proper airflow throughout the facility by means of air distribution ductwork. Air distribution system shall be comprised of ductwork, fittings, grilles, registers, and/or diffusers. Ductwork shall be constructed of galvanized steel or aluminum sheets and installed as per SMACNA “HVAC Duct Construction Standards (Metal and Flexible).” Flexible non-metallic duct may be used for final unit/diffuser connection in ceiling plenums. These flexible duct run-outs shall be limited to 3 meters in length. All supply and return air ductwork shall be routed concealed in finished areas provided with drop ceiling or plenums. Duct insulation shall be provided for all supply ductwork and for return ductwork not located within the conditioned area.

5.2.3. DUCT INSULATION

All interior fresh air and supply ducts shall be insulated with a minimum of 50mm thick flexible mineral fiber with integral vapor barrier. Interior return ducts shall be insulated only when located inside unconditioned areas. Ducts exposed to weather shall be insulated with a minimum of 100mm insulation. The outside of the insulation shall be covered with a vapor barrier and then covered with an aluminum protective jacket. There shall be no breaks in vapor barrier. Air ducts from Heat-Cool-Units shall be installed exposed and not insulated, as indicated on Drawing. “ANA HEAT-COOL DESIGN-01”, (Appendix-A11).

5.2.4. DIFFUSERS, REGISTERS AND GRILLES:

Shall be factory fabricated of steel or aluminum and distribute the specified air quantity evenly over the space intended. The devices shall be round, half round, square, rectangular, linear, or with perforated face as determined by the design. Units will be mounted in ceilings, high sidewalls, or directly to ductwork and shall be sized for the airflow to be delivered with a maximum NC rating of 35. Pressure loss through the diffuser shall be considered in sizing the duct system and the system static pressure calculations.

5.2.5. BRANCH TAKE-OFFS

Air extractors or 45° entry corners shall be provided at all branch duct take-offs. Manual volume control dampers shall be included at the branch duct take-offs as shown and where required to facilitate air balancing.

5.2.6. WALL PENETRATIONS

Building wall penetrations shall be carefully made so as not to deteriorate the structural integrity of the wall system.

5.2.7. CONTROL WIRING AND PROTECTION DEVICES

Control wiring and protection devices shall be the manufacturer’s standard, pre-wired, and installed at the factory. Operation of the control system shall be manufacturer’s standard configured for 220V/50Hz or 24V operation.

5.2.8. THERMOSTATS

All thermostats shall be located near the return grills and mounted 1.5 meters above the floor and shall be easily accessible. In lieu of a thermostat, a temperature sensor may be located in the room and connected to the control thermostat near the unit. Thermostats located inside occupied areas shall be provided with lockable covers.

5.2.9. ELECTRIC MOTORS

All HVAC motors shall be Totally Enclosed Fan Cooled (TEFC) type and rated for minimum 40 C ambient.

5.2.10. OUTDOOR EQUIPMENT

Screen walls or elevated platforms shall be provided for protection of outdoor HVAC

equipment from wind-blown sand and debris.

5.3. Wall Penetrations

Building wall penetrations shall be carefully made so as not to deteriorate the structural integrity of the wall system. The Contractor shall consult with the building manufacturer, if possible, to determine the best way to penetrate the wall. If the building manufacturer is not available, a structural engineer shall be consulted. In either case, the recommendations of the engineer shall be strictly adhered to.

5.3.1. CONTROL WIRING AND PROTECTION DEVICES

Control wiring and protection of the air conditioning units being offered must be the manufacturer's standard, pre-wired, installed in the unit at the factory or as recommended. Thermostats shall be located near the unit return. For units serving more than one area, the thermostat shall be located near the return of the space with the highest heat generation.

5.3.2. AIR FILTRATION

All supply air shall be filtered using manufacturer's standard washable filters mounted inside the unit. In addition, all outdoor air intakes, where required shall be equipped with 50 mm (2 inch) thick washable filters.

5.4. VENTILATION AND EXHAUST SYSTEMS

All fans shall be used for building ventilation and pressurization with capacities to be selected for minimum noise level generated. Unit mounted fans either used for supply or exhaust shall be centrifugal forward curved, backward inclined, or airfoil fans with non-overloading characteristics of high efficiency and quiet running design. The fans shall be of the heavy-duty type with durable construction and proved performance in a desert environment. Each exhaust fan shall be provided with motorized or gravity dampers which close automatically when the fan is not running. Also, each fan shall be complete with vibration isolator, external lubricators, and all accessories and sound attenuators as necessary.
Supply intake openings shall be provided with motorized dampers which are interlocked with the exhaust fan. The dampers open or close when the exhaust fan is on or off respectively.
Maintenance shops and similar spaces that use solvents and oils shall be provided with mechanical exhaust air systems. Exhaust fans shall be centrifugal wall mounted type. Intake openings shall be provided with motorized dampers which are interlocked with the exhaust fans. Provide minimum of 16 ACH. The systems shall consist of centrifugal fan, ductwork, exhaust grills, and interlock controls. Comply with Industrial Ventilation UFC 3-410-04N.
Toilet and Wash Area: Minimum exhaust ventilation shall be the larger of 35 m3/h / m2 floor or 85 m3/h / toilet (WC). At extreme cold in winter these values can be reduced for short periods to 10 m3/h / m2 or 40 m3/h / toilet (WC) to conserve heat.
Kitchen Hood Exhaust and Make-up Air: As required and as per Kitchen design specialist and equipment supplier requirements. Provide minimum of 250 cfm per linear foot of hood length or 75 cfm per square area of hood per International Mechanical Code. The designer shall take special note that multiple large propane stoves will be installed in the kitchen. The steam generated by the local style of cooking with large pots is immense in comparison to western standards, and the additional need for ventilation must be accounted for in the design. Also, the cooks are accustomed to standing on top of the stoves in order to stir the large cauldrons of food. This common cooking practice should be taken into consideration when designing the exhaust hood. The height of the hood above the stovetop should be such that a man of average stature could stand upright without risk of hitting his head on the hood. Design per NFPA 92A, 96, 204, and 211. Make up air intake shall be integral with the hood system or be located as close to the exhaust intake to prevent cold drafts.

To reduce sand and dirt migration, outside air intakes shall be located as high as possible within architectural constraints. The intakes shall be sized so that free air velocities are below 2.5 m/s (500 fpm). For inhabited buildings locate all air intakes at least 1.5 (center-line of intake) meters above the ground. Each air intake shall be provided with a motorized damper which is interlocked with the exhaust fan.

5.4.1. SUBMITTALS

The Contractor shall submit the following for the equipment to be provided under this section of the specification: manufacturer's data including performance characteristics at design conditions; catalog cuts showing dimensions, performance data, electrical requirements, compliance with standards as stated in paragraph CODES, STANDARDS AND REGULATIONS; drawings indicating location and installation details.

5.5. ELECTRIC RESISTANCE HEATERS

5.5.1. Unit Heater. Electric resistance heaters shall be installed in small spaces where only heating is required. Provide a self-contained electric heating unit, suspended from ceiling or structure, with fan and heating elements. Provide control-circuit terminals and single source of power supply with disconnect. Heating wire element shall be nickel chromium. Include limit controls for overheat protection of heaters. Provide tamper resistant integral thermostat.

5.5.2. Cabinet Heater. Cabinet heaters shall be installed in small spaces where only heating is required. Provide a self-contained electric heating unit, recessed mounted in wall or structure, with fan and heating elements. Provide control-circuit terminals and single source of power supply with disconnect. Heating wire element shall be nickel chromium. Include limit controls for overheat protection of heaters. Provide tamper resistant integral thermostat.

5.5.3. Infrared Heaters. Infrared heaters shall be provided for spot heating of a large area such as maintenance bays and warehouses. Infrared heaters shall use electricity. Contractor shall position the infrared heaters to direct the radiant heat to only those areas where people normally work. Coordinate with User. Provide control-circuit terminals and single source of power supply with disconnect.

5.6. SUBMITTALS

The Contractor shall submit the following for the equipment to be provided under this section of the specification: manufacturer's data including performance characteristics at design conditions; manufacturer's certificate stating that each unit will perform to the conditions stated, catalog cuts showing dimensions, performance data, electrical requirements, compliance with standards as stated in paragraph CODES, STANDARDS AND REGULATIONS; complete shop drawings indicating location and installation details.
The manufacturer shall also submit a 2 year warranty for each of the units.

5.7. TEST ON COMPLETION

5.7.1. After completion of the work, the Contractor shall demonstrate to the Contracting Officer that the installation is adjusted and regulated correctly to fulfill the function for which it has been designed. The Contractor shall test, adjust, balance and regulate the section or sections of concern as necessary until the required conditions are obtained. Operational test shall be conducted once during the winter and once during the summer. Coordinate with the Contracting Officer on when the test shall be scheduled. Include tests for all interlocks, safety cutouts and other protective device to ensure correct functioning. All such tests shall be carried out and full records of the values obtained shall be prepared along with the final settings and submitted to the Contracting Officer in writing.

5.7.2. The following tests and readings shall be made by the Contractor in the presence of the Contracting Officer and all results shall be recorded and submitted in a tabulated form.

a. Ambient DB and WB temperatures
b. Room Inside Conditions:
    1. Inside room DB & WB temperatures
    2. Air flow supply, return and/or exhaust
    3. Plot all temperatures on psychrometric chart
c. Air Handling Equipment: Air quantities shall be obtained by anemometer readings and all

necessary adjustments shall be made to obtain the specified quantities of air indicated at each inlet and outlet.

Following readings shall be made:

1. Supply, return and outside air CMH (CFM) supplied by each air conditioning system.
2. Total CMH (CFM) exhausted by each exhaust fan
3. Motor speed, fan speed and input ampere reading for each fan
4. Supply, return and outside air temperature for each air-conditioning system.

d. Electric Motors:

For each motor: (1) Speed in RPM
(2) Amperes for each phase
(3) Power input in KW

5.8. ELECTRICAL REQUIREMENTS FOR HVAC EQUIPMENT

a. Note that electrical requirements for all HVAC systems shall be designed and installed to operate on the secondary power standard required herein. The existing power distribution system may require modifications or upgrades to support the additional power required by the HVAC unit. The Contractor is responsible to field verify all the conditions and provide complete shop drawings showing any incidental power upgrades. All electrical work shall comply with the National Electric Code.

b. All thermostats shall be wall mounted near the return grilles in the room with the highest heat load generation and mounted 1.5 meters (5 feet) above the floor. In lieu of a thermostat, a temperature sensor may be located in the same location or in the return duct and connected to a thermostat located near the unit return. Thermostat shall be mounted 1.5 meters (5 feet) above the finished floor and be easily accessible. Thermostats for the latrine facilities shall be located near the unit return and mounted 1.5 meters (5 feet) above the finished floor. Operation of the control system shall be at the manufacturer's standard voltage for the unit.

c. The following are the minimum requirements for motors regarding enclosure, insulation and protection:

1. Compressor Hermetic: Provide inherent (internal) overload protection.
2. Condenser: Provide internal thermal overload protection.
3. Evaporator (Open Class "A") fan motor type provides internal thermal overload protection.

5.9. CEILING FANS

5.9.1. CEILING FAN

Provide 1320mm blade ceiling fans at one per 40 square meters of floor space. Fans shall have reversible motors. Center or distribute evenly in room. Coordinate placement with the lighting plan to prevent conflict or casting shadows. Fan mount shall be flush, standard, or angle mount depending on ceiling height. Fan shall be mounted such that the fan blade is approximately 2.44 meters above the finished floor. The fan shall be provided with out light kit. The finish shall be factory painted white. The controls shall be from either a single pole switch or from two 3 way switches to provide on/off operation. The electrical supply shall be 230volts, single phase, and 50 hertz. Install per manufacturers' instructions.

5.9.2. SUBMITTALS.

The Contractor shall submit the following for the equipment to be provided under this section of the specification: manufacturer's data including performance characteristics at design conditions; catalog cuts showing dimensions, performance data, electrical requirements, compliance with standards as stated in paragraph CODES, STANDARDS AND REGULATIONS; drawings indicating location and installation details.

6. PLUMBING

6.1. SCOPE OF WORK.

6.1.1. GENERAL

The Contractor shall design and build domestic cold and hot water systems, waste, drain and vent systems, waste-oil collection and storage and fuel-oil storage and distribution systems required in the facilities identified in Section 1010 Scope of Work and as described herein. The Contractor shall also be responsible for complete design and construction of all domestic and special plumbing systems required for full and safe operations in the Generator Plant, Water Storage and other facility or structures required in this contract.

The work covered in this scope also includes the delivery to site, erection, setting to work, adjusting, testing and balancing and handing over in full operating condition all of the plumbing equipment and associated plumbing works.

6.1.2. SUB-CONTRACTORS QUALIFICATIONS

The plumbing systems shall be executed by a plumbing specialist subcontractor experienced in the design and construction of these types of systems.

6.1.3. STANDARD PRODUCTS

All materials and equipment shall be standard product of a manufacturer regularly engaged in the manufacture of the product and shall duplicate items that have been in satisfactory use for at least two (2) years prior to bid opening.

6.2. CODES, STANDARDS AND REGULATIONS

The design and installation of equipment, materials and work covered under the plumbing services shall conform to the following standards, codes and regulations where applicable except where otherwise indicated under particular clause(s). The publications to be taken into consideration shall be those of the most recent editions. Standards other than those mentioned herein may be accepted provided that the standards chosen are internationally recognized and meet the minimum requirements of the specified standards. The Contractor shall submit proof of equivalency if requested by the Contracting Officer.

IPC – International Plumbing Code

NFPA - National Fire Protection Association

ASHRAE – American Society of Heating, Refrigeration and Air-Conditioning Engineers

ASME – American Society of Mechanical Engineers

ASTM – American Society for Testing and Materials

AWS – American Welding Society

6.3. PLUMBING SYSTEMS REQUIREMENTS

6.3.1. WATER

Domestic cold and hot water shall be provided in the facilities to serve the water usage and plumbing fixtures provided for the facility. Water service to each facility shall enter the building in a mechanical, toilet, storage, or similar type space. The building service line shall be provided with a shut off valve installed either outside in a valve pit or inside the mechanical room or similar spaces. Water piping shall not be installed in or under the concrete foundation. All water piping shall be routed parallel to the building lines and concealed in all finished areas. Insulation shall be provided where required to control sweating of pipes or to provide protection from freezing.

6.3.2. PIPING MATERIALS

Domestic water shall be distributed by means of standard weight (schedule 40) galvanized steel pipe. Waste and vent piping can be made of either galvanized steel pipe (schedule 40), or Polyvinyl Vinyl Chloride (PVC) conforming to ASTM D 2665. Corrosion protection shall be provided if galvanized piping comes in contact with earth or masonry floors, walls or ceilings.

6.3.3. PLUMBING FIXTURES

The following typical plumbing fixtures shall be provided:

a. Eastern Water Closet with flush tank assembly. **.** Provide acid resisting fired porcelain enameled cast iron water closet complete with rotating No-Hub 'P' trap and No-Hub coupling to meet piping requirements. Eastern Style water closet shall be furnished with integral non-skid foot pads and bowl wash down non-splashing flushing rim. The water closet shall be completely self supporting requiring no external mounting hardware and shall be flush with floor. The Eastern Style water closet shall incorporate waterproofing membrane flashing flange. Provide a cold water spigot 300mm above finished floor on the right (from a perspective of standing inside of the cubicle and looking out) sidewall of the cubicle. Spigot shall have a flexible hose and spray nozzle such that the occupant can wash over the water closet. Toilets shall be oriented north and south. Toilets shall not face east or west.
.Western style toilets shall be provided as requested by the User.

b. Lavatories. All sinks shall be trough type constructed of block and concrete with ceramic tile exterior and lining capable of withstanding abuse. Faucets shall be chrome plated brass single lever mixing type. Provide maintenance access to waste piping and P-traps from under the sink. Lavatories inside the prison cells shall be tamper-proof with integral spout, soap depression, and outlet connection to slip 40mm OD tubing.

Lavatories. Enameled cast iron, wall or counter mounted. Brass fittings provided for water supplies. (To be used in American or Afghan/American mixed facilities only.)

c. Janitor's Sink. Floor mount janitor, enameled cast iron with copper alloy rim guard. Provide hot and cold water valves with manual mixing. Faucet handles shall be copper alloy. Include a stainless steel shelf and three mop holders.

d. Shower. Showerhead and faucet handles shall be copper alloy. Provide for manual mixing with hot and cold water valves. In addition to a shower head, provide each shower stall with a threaded faucet approximately 1.2 m AFF with hot and cold-water controls, mixing valve and a diverter type valve so water can be directed to either the shower or to the lower faucet. Shower shall be provided with low flow shower head. The shower head shall be heavy duty type and securely fastened to the wall.

e. Service Sink . Standard trap type, enameled cast iron. Service sinks provided in maintenance areas shall be metallic, and in battery rooms acid resistant.

f. Kitchen Sink. Single Bowl corrosion resisting formed steel. Faucet bodies and spout shall be cast or wrought copper alloy. Handles, drain assembly, and stopper shall be corrosion resisting steel or copper alloy.

g. Floor Sink (P-13). Provide floor sink, circular or square, with 300mm overall width or diameter and 250 nominal overall depth. Acid resistant enamel interior with cast iron body, aluminum sediment bucket and perforated grate of cast iron. Outlet size as indicated on plans.

h. Floor or Shower Drain: Cast iron construction with galvanized body, integral seepage pan, and adjustable perforated or slotted chromium plated bronze, nickel-bronze, or nickel brass strainer consisting of a grate and threaded collar. Toilet room floor drains are similar except are provided

with built-in, solid, hinged grate.

i. Room hose bibs and floor drains shall be provided as required. Afghan dining facility kitchen area clean-up hose bib to be supplied with connecting hose on reel including approximately 12 meters of hose. Provide clean-up spray nozzle with hose assembly.

j. Provide P-Traps per International Plumbing Code IPC for all fixture drains, floor and trench drains, and shower drains. P-traps shall have minimum of 50 mm water seal.

6.3.4. HOT WATER

Hot water shall be provided for the facility to supply 49°C (120°F) hot water to fixtures and outlets requiring hot water. Hot water of a higher temperature shall be provided only where required for special use or process. Hot water piping shall be routed parallel to the building lines and concealed within finished rooms. All hot water piping shall be insulated. A hot water re-circulating pump shall be provided if hot water piping run exceeds 30m.

6.3.5. HOT WATER HEATERS

The hot water shall be generated by electric water heaters. The unit shall be typically located inside a mechanical room, storage room, toilet/janitor room or similar type space. The unit shall be of the commercially available tank type having low or medium watt density electric heating elements. Gas (natural or liquid propane) powered hot water generators shall be provided to satisfy large hot water requirements when economically justifiable and practical. In cases where the pressure of the water coming into the tank will violate manufacturer recommendations, a pressure reducer shall be installed in the line before the water heater. Also, all water heaters shall be equipped with a blow-off valve that will empty into a nearby floor drain or to the exterior of the building.

6.4. WASTE, DRAIN AND VENT SYSTEM

Floor drains shall be provided in each room that contains a water source. Floor drains shall be provided in the mechanical equipment and toilet rooms as required. Floor drains shall be provided next to the electric water heaters. In mechanical rooms, floor drains shall be provided to avoid running drain piping long distances above or over the floor. A trench drain shall be provided for the DFAC Kitchen. All waste and vent piping shall be provided in accordance with the latest edition of IPC. Drain outlet shall use p-trap system to trap sewer gases. P-trap drain should be a one-piece system without removable parts. Every trap and trapped fixture shall be vented in accordance with the IPC.

6.5. TESTING AND COMMISSIONING

The Contractor shall test all piping systems in accordance with IPC International Plumbing Code. The final test shall include a smoke test for drainage and vent system and pressure test for the domestic water piping. After completing the work, the Contractor shall demonstrate that all plumbing systems operate to fully satisfy the function for which these systems have been designed. The Contractor shall test, adjust, balance and regulate the system and its controls as necessary until the required designed conditions are met. The Contractor shall include tests for interlocks, safety cutouts and other protective devices to demonstrate safe operation. All such tests shall be carried out in the presence of the Contracting Officer and full written records of the test data and final settings shall be submitted to the Contracting Officer. After all tests are complete, the entire domestic hot and cold water distribution system shall be disinfected. The system shall not be accepted until satisfactory bacteriological results have been obtained.

7. FIRE PROTECTION

7.1. GENERAL

Facility construction and fire protection systems shall be installed in accordance with the publications

listed herein and the publications referenced therein. Where a conflict occurs among various criteria, the most stringent requirement shall take precedence.

7.2. BUILDING CONSTRUCTION

Building construction shall conform to fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements of the building code.

7.3. LIFE SAFETY

Facilities features will be provided in accordance with NFPA 101, among other references, to assure protection of occupants from fire or similar emergencies.

7.4. FIRE PROTECTION EQUIPMENT

All fire protection equipment shall be listed by Underwriters' Laboratories (UL) or approved by Factory Mutual (FM) or equivalent and shall be listed in the current UL Fire Protection Equipment Directory or Factory Mutual Approval Guide or equivalent.

7.5. WATER SUPPLY FOR FIRE PROTECTION

A dedicated fire protection water supply is unavailable. Therefore, alternate methods of design and construction are being instituted.

7.6. PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers shall be provided inside all facilities and at exterior locations as required in accordance with NFPA 10. Generally, extinguishers will be of the multi-purpose dry chemical type except for occupancies requiring a special type extinguisher (e.g., carbon dioxide portable fire extinguishers for electrical rooms).

8. FIRE PROTECTION

8.1. GENERAL

Facility construction and fire protection systems shall be installed in accordance with the publications listed herein and the publications referenced therein. Where a conflict occurs among various criteria, the most stringent requirement shall take precedence.

8.2. BUILDING CONSTRUCTION

Building construction shall conform to fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements of the building code.

8.3. LIFE SAFETY

Facilities features will be provided in accordance with NFPA 101, among other references, to assure protection of occupants from fire or similar emergencies.

8.4. FIRE PROTECTION EQUIPMENT

All fire protection equipment shall be listed by Underwriters' Laboratories (UL) or approved by Factory Mutual (FM) or equivalent and shall be listed in the current UL Fire Protection Equipment Directory or Factory Mutual Approval Guide or equivalent.

8.5. WATER SUPPLY FOR FIRE PROTECTION

A dedicated fire protection water supply is unavailable. Therefore, alternate methods of design and construction are being instituted.

8.6. PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers shall be provided inside all facilities and at exterior locations as required in

accordance with NFPA 10. Generally, extinguishers will be of the multi-purpose dry chemical type except for occupancies requiring a special type extinguisher (e.g., carbon dioxide portable fire extinguishers for electrical rooms).

9. ELECTRICAL

9.1. GENERAL

Contractor shall design and construct all necessary electrical systems for this project. This includes design, construction, all necessary labor, equipment, and material for a fully functional system. Secondary electrical distribution system shall be 220/380 volt, 3-phase, 4 wire, 50 hertz. Design of the electrical system within facilities shall include, but is not limited to interior secondary power distribution system and lighting and power branch circuit and devices. All systems shall be designed for the ultimate demand loads, plus 25% spare capacity.

9.2. DESIGN CRITERIA

9.2.1. APPLICABLE STANDARDS

a. Design shall be in the required units as stipulated herein.
b. Conflicts between criteria and/or local standards shall be brought to the attention of the Contracting Officer for resolution. In such instances, all available information shall be furnished to the Contracting Officer for approval.
c. All electrical systems and equipment shall be installed in accordance with NFPA code requirements.
d. Acceptance Testing: Contractor shall develop and submit for approval complete acceptance test procedures on all systems provided. As a minimum the testing procedures shall comply with the requirements of NFPA 70 (NEC) and International Electrical Testing Association Inc. (NETA).
e. Any other applicable references listed herein, including the following:

ANSI/IEEE Std 81-1983
ANSI/NETA ETT-2000
ANSI/NETA MTS 7.2.2-2001
EIA ANSI/TIA/EIA-607: (1994) Commercial Building Grounding/Bonding Requirement Standard.
Factory Mutual (FM) Approval Guide-Fire Protection (2002).
IBC - International Building Code
IEEE C2 National Electrical Safety Code (NESC)
IEEE Std 81.2-1991
IEEE 100
IEEE 241 - 1990
IEEE 242 - 2001
IEEE standard 519-1992
IEEE C57.12.22
IEEE C57.12.34
IEEE C57.12.28
IESNA Lighting Handbook
International Electrical Testing Association Inc. (NETA) Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems
NFPA 10, Portable Fire Extinguishers
NFPA 70, National Electrical Code
NFPA 101, Life Safety Code
TM 5-811-1 Design: Electrical Power Supply and Distribution
UFC 3-520-01 Interior Electrical Systems, 10 June 2002
UFC 3-550-03FA Electrical Power Supply and Distribution
UFC 3-600-01 Fire Protection Engineering for Facilities
Underwriters' Laboratories (UL) Fire Protection Equipment Directory (2002).

9.3. Material:

9.3.1. GENERAL:

Unless noted otherwise, all material used shall be in compliance with the requirements of UL standards. In the event that UL compliant materials are not available, Contractor may then select applicable British Standards (BS), IEC, CE, CSA, GS, DIN listed material (or equivalent), but the contractor must prove equivalence and must provide the government with a full copy of the relevant specification(s)/standard(s). Material and equipment installed under this contract shall be for the appropriate application and installed in accordance with manufacturers recommendations.

Equipment enclosure types shall be in compliance with the National Electrical Manufacturer's Association (NEMA) or the International Electro-Technical Committee (IEC) standards.

Material and equipment installed under this contract shall be for the appropriate application. Materials and equipment shall be installed in accordance with recommendations of the manufacturer. Major components of equipment shall have the manufacturer's name, address, type or style, voltage and current rating, and catalog number on a non-corrosive and non-heat sensitive plate, securely attached to the equipment. All equipment delivered and placed in storage, prior to installation, shall be protected from the weather, humidity and temperature variation, dirt and dust, and any other contaminants. All equipment shall be in new condition, undamaged and unused.

9.3.2. STANDARD PRODUCT:

All material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least two (2) years prior to bid opening.

9.3.3. DESIGN CONDITIONS:

All equipment shall be rated and designed for 49 degrees Celsius (120 degrees Fahrenheit) and minimum elevation of 1790 meters (5876 feet) above sea level.

9.3.4. RESTRICTIONS:

Aluminum conductors shall not be specified or used.

9.4. Design Requirements

9.4.1. ELECTRICAL DISTRIBUTION SYSTEM

Contractor shall perform necessary load calculations to determine if existing power supplies to all facilities are sufficient for existing loads plus 25% spare capacity. Should the existing electrical supply be insufficient to power the new demand loads plus spare capacity, the contractor shall notify the COR. In such instances, the contractor shall provide all the information regarding the required number of new feeders and panels to the Contractor Officer. Design and installation of any additional feeder required from any panel will be the responsibility of the contractor. Contractor shall coordinate power needs with the Contracting Officer relative to needs met by each new panel, and limit power interruption to other services already connected.

Where required, the contractor shall provide and install properly sized service entrance feeder from each power source to the service entrance equipment located inside of each facility.

All panel boards shall be circuit breaker ‘bolt-on’ type panels. Minimum size circuit breaker shall be rated at no less than 20-amperes. Circuit breakers shall be connected to bus bars within the panel boards. Daisy chain (breaker-to-breaker) connection(s) are not acceptable. Indoor distribution panels shall be flush mounted in finished areas and surface mounted in unfinished areas. All circuit breakers shall be label with an identification number corresponding to the panel schedule. Three poles circuit breaker shall be a single unit and not made up of three single pole circuit breakers connected with a wire or bridged to make 3-pole breaker. All wiring shall be copper, minimum 4mm2 (12 AWG) installed in metal conduit.

Wiring shall be recessed in finished areas and surface mounted in unfinished areas. Flush mounted panels shall be provided with spare empty conduits from the panel to unfinished area for future use. All new panels shall be provided with a minimum of 25% spare capacity for future load growth. Receptacles shall be duplex type 220 V, 50 hertz, with Earth Ground rated for 20A or better and shall be compatible with the required secondary power. All splicing and terminations of wires shall be performed in junction or device boxes. Proper wire nuts/connectors shall be used for splicing wire. No twist-wire connections with electrical tape wrapped around it shall be acceptable. All electrical installations shall be in accordance with the NEC. For panels 225 Amperes and above, provide an ammeter, voltmeter and kilowatt-hour meter to monitor energy usage. A selector switch shall be provided for reading all 3 phases. Circuits shall be provided for all mechanical equipment and final connections made. Receptacle locations shall be coordinated with architectural requirements.

Contractor shall provide (design and install) circuits for all mechanical equipment and any other equipment that requires power and make the final connections. The contractor shall provide dedicated electrical circuits for the refrigerator(s) and electrical heaters.

All loads shall be coordinated to provide balanced loading. Phase imbalance at each panel shall not exceed 5%. Voltage Drop for branch circuits shall not exceed three percent. Voltage drop for the combination of branch and feeder circuits shall not exceed five percent. All circuit breakers shall use down-stream coordination to ensure that the breaker nearest a fault or overload is the first to trip.

9.4.2. LIGHTING

Design levels shall be per IES standards as a minimum. For convenience, the following lighting level table is listed. Note: all spaces listed below may not be within the work required within this contract.

Living room/Quarters	30 FC (320 Lux)
Toilets, Showers, Latrines, washrooms	20 FC (200 Lux)
Corridors, Stairways	20 FC (200 Lux)
Offices	30 FC (320 Lux)
Reading	30 FC (320 Lux)
Egress path	01 FC (10 Lux)
Areas adjacent to egress path	0.05 FC (0.5 Lux)
Warehouses	10 FC (110 Lux)

FC = footcandle

Indoor lighting for all areas shall consist of fluorescent light fixtures. Exterior lighting will be installed as referenced. Moisture resistant/waterproof fluorescent light fixtures shall be provided in high humidity and wet areas such as latrines and showers. Battery powered ‘emergency’ and ‘exit’ lights shall be provided within each building, as applicable, for safe egress during a power outage. All light fixtures shall be factory finished, complete and operational, to include but not be limited to, lens, globe, lamp and ballast. Industrial type fluorescent light fixtures shall not be used. Every room shall be provided with a minimum of one light switch. Light fixtures shall be mounted approximately 2.5-meters (8 feet) above finished floor (AFF), minimum. Fixtures may be pendant or ceiling mounted, depending on the ceiling type and height.

9.4.3. LIGHT FIXTURES

Lighting fixtures shall be a standard manufacturer’s product. Fluorescent light fixtures shall be power factor corrected and equipped with standard electronic ballast(s). All light fixtures shall properly operate using standard lamps available locally. Fixtures shall be fully factory wired and designed for appropriate application, i.e. appropriate for that location where installed.

9.4.4. ABOVE MIRROR LIGHTS

Above mirror lights shall be provided in toilet rooms.

9.4.5. EMERGENCY LIGHTING

Battery powered emergency lights shall be provide within each building per NFPA 101 for safe egress

during power outage. Fixtures shall be provided with self-contained nickel cadmium battery pack to operate on standby for a minimum of 90 minutes. Unit shall have test, reset and lamp failure indication buttons. Primary operating voltage shall be 220 volts.

9.4.6. LIGHT SWITCHES

Light switches shall be single pole. A minimum of one light switch shall be provided in every room. Lighting in large rooms/areas may be controlled from multiple switches. In all rooms/areas with multiple entrances, the contractor shall provide three-way switching for lighting control.

9.4.7. RECEPTACLES

General-purpose receptacles shall be as required herein. All receptacles shall be duplex, unless otherwise specified in this section, section 01010, the NEC, or other referenced standard.

In new spaces, receptacles shall be placed at 3-meter (10 feet) intervals (maximum) in general. Existing receptacles in areas slated for remodeling shall be relocated as necessary and in accordance with applicable standards to serve the needs of the areas being served. Countertop outlets shall be provided in accordance with the NEC. Areas with computer workstations or similar equipment will have additional receptacles. Sinks will have a receptacle above, with one duplex receptacle serving dual sinks. Receptacles in wet/damp areas or within 1 meter (~3 feet) of sinks, lavatories, or wash-down areas shall be ground fault circuit interrupter (GFCI) type or Residual Current Disconnect (RCD) type, with the trip setting of 10 milliamperes or less. Total number of duplex receptacles shall be limited to six (6) per 20-ampere circuit breaker.

9.4.8. CONDUCTORS

All cable and wire conductors shall be copper. Conductor jacket or insulation shall be color coded to satisfy NEC requirements. The use of 75 or 90 degree C (minimum) terminals and insulated conductors is required. Use of 75 degree C conductors on circuits with protective device terminals rated for 60 degree C will not be accepted.

9.4.9. GROUNDING AND BONDING

Grounding and bonding shall comply with the requirements of NFPA 70. Underground connections shall be exothermal weld. All exposed non-current carrying metallic parts of electrical equipment in the electrical system shall be grounded. An insulated grounding conductor (separate from the electrical system neutral conductor) shall be installed in all feeder and branch circuit raceways. Grounding conductor shall be green-colored, unless the local authority requires a different color-coded conductor. Ground rods shall be copper-clad steel. Final measurement of the ground resistance shall be in compliance with the requirements of the local authority but shall not exceed 25 ohms when measured less than 48 hours after rainfall.

9.4.10. ENCLOSURES

Enclosures for exterior and interior applications shall be NEMA Type 3S (IEC Classification IP54) and NEMA Type 1 (IEC Classification IP10), respectively.

9.4.11. CONDUIT RACEWAY SYSTEM

A metal conduit system shall be complete, to include but shall not be limited to, necessary junction and pull-boxes. The smallest conduit size shall be 20mm (0.75 inch) in diameter. All empty conduits shall be furnishing with pullwire. Conduit shall be recessed in finished areas and surface mounted in unfinished areas. System design and installation shall be per NFPA 70 requirements. Exterior underground conductors shall be installing in PVC conduit at a depth of 24 inches (610 mm).

9.4.12. IDENTIFICATION NAMEPLATES

Major electrical equipment, such as transformers, panelboards, load centers, etc. shall be provided with permanently installed engraved identification nameplates.

9.4.13. SCHEDULES

All panel boards and load centers shall be provided with a panel schedule. Schedule shall be typed

written in English.

9.4.14. SINGLE LINE DIAGRAM

Complete single line diagrams shall be provided for all systems installed. All major items in each system shall be identified and labeled for respective rating. Single line diagrams for each system, installed in a clear plastic frame, shall be provided.

-- END OF SECTION --

SECTION 01335

SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

PART 1 GENERAL

1.1 REFERENCE

The publication listed below forms a part of this specification to the extent referenced. The publication is referenced to in the text by basic designation only.

CONSTRUCTION SPECIFICATIONS INSTITUTE

Manual of Practice
Construction Specifications Institute
http://www.csinet.org/s_csi/index.asp
601 Madison Street
Alexandria, Virginia
22314-1791

NATIONAL INSTITUTE OF BUILDING SCIENCES (NIBS)

Unified Master Reference List (UMRL)
National Institute of Building Sciences
1090 Vermont Avenue, NW, Suite 700
Washington, DC 20005-4905
Email: nibs@nibs.org
FAX: (202) 289-1092
Tele: (202) 289-7800

AFGHANISTAN ENGINEER DISTRICT

AFGHANISTAN ENGINEER DISTRICT
http://www.aed.usace.army.mil
U.S. Army Corps of Engineers
Attn.: Qalaa House
APO AE 09356

TRANSATLANTIC PROGRAMS CENTER

Design Instructions Manual

U.S. Army Corps of Engineers
http://www.tac.usace.army.mil/extranet/
Transatlantic Programs Center
201 Prince Frederick Drive
Winchester, Virginia 22602

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 DESIGN SUBMITTALS

Contractor Furnished design submittals are the various design documents which primarily consist of specifications, drawings and design analysis and calculations. The Design-Build Contractor shall not begin construction work until the Government has reviewed the Design-Build Contractor's final design and has cleared it for construction. Clearance for construction shall not be construed as meaning Government approval. Unless otherwise indicated, the risk for the design is the sole responsibility of the Design-Build Contractor.

As a minimum, design submittals shall be submitted at the following intervals:

Concept design (35%): In addition to submission requirements, a design analysis/basis of design shall be required, including a proposed listing of specification sections.

General design (65%): In addition to submission of designs, the contractor shall provide the design analysis, design specifications and design calculations.

Final (100%): In addition to submission requirements, a final draft of specifications and design analysis/basis of design shall be required.

The 65% and 100% submittals shall also contain the previous Dr Checks comments. Each of the Dr Checks comments shall be reviewed by the respective AE discipline to ensure that the comment has been adequately addressed. AE response of “will comply” is not sufficient. Responses shall describe how the comment was addressed, the applicable drawings sheet which the comment was incorporated and any additional comments and references to the adequacy for the rebuttal.

Minimum submission requirements for each phase submittal shall be as defined herein.

1.2.2 CONSTRUCTION SUBMITTALS

1.2.2.1 Contractor Furnished Government Approved Construction Submittals

Government approved construction submittals are primarily related to plans (Contractor Quality Control, Accident Prevention, Resident Management System, Area Use, etc.) schedules (Project Schedule/Network Analysis), and certificates of compliance. They may also include proposed variations to approved design documents in accordance with the paragraph entitled "VARIATIONS".

1.2.2.2 For Information Only Construction Submittals (FIO)

All submittals not requiring Designer of Record or Government approval will be for information only.

1.3 SUBMITTAL CERTIFICATION

The CQC organization shall be responsible for certifying that all submittals and deliverables have been reviewed in detail for completeness, are correct, and are in strict conformance with the contract drawings, specifications, and reference documents.

1.3.1 Effective Quality Control System

The Design-Build Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with Contract Clause 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION - ALTERNATE I and specification section 01451 CONTRACTOR QUALITY CONTROL.

1.3.1.1 Organizational Responsibility

The quality control system shall cover all design, construction, subcontractor, manufacturer, vendor, and supplier operations at any tier, both onsite and offsite.

1.3.1.2 CQC System Manager Review and Approval

Prior to submittal, all items shall be checked and approved by the Design-Build Contractor's Quality Control (CQC) System Manager. If found to be in strict conformance with the contract requirement, each item shall be stamped, signed, and dated by the CQC System Manager. Copies of the CQC organizations review comments indicating action taken shall be included within each submittal.

1.3.1.3 Determination of Compliance

Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements by the Contracting Officer. The contractor shall submit all required documentation with submittals. The U.S. Army Corps of Engineer (USACE) will not accept partial submittals.

1.3.2 Responsibility for Errors or Omissions

It is the sole responsibility of the Design-Build Contractor to ensure that submittals do or do not comply with the contract documents. Government review, clearance for construction, or approval by the Contracting Officer shall not relieve the Design-Build Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract.

1.3.2.1 Government Review

Government review, clearance for construction, or approval of post design construction submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory.

1.3.3 Substitutions

After design submittals have been reviewed and cleared for construction by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless justified as indicated in the paragraph entitled VARIATIONS.

1.3.4 Additional Submittals

In conjunction with Contract Clause 52.236-5 MATERIAL AND WORKMANSHIP. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work.

1.3.5 Untimely and Unacceptable Submittals

If the Design-Build Contractor fails to submit submittals in a timely fashion, or repetitively submits submittals that are incomplete or not in strict conformance with the contract documents, no part of the time lost due to such actions shall be made the subject of claim for extension of time or for excess costs or damages by the Design-Build Contractor.

1.3.6 Stamps

Stamps shall be used by the Design-Build Contractor on all design and post design construction submittals to certify that the submittal meets contract requirements and shall be similar to the following:

Design-Build Contractor (Firm Name)
Contract Number
Contract Name

I certify that this submittal accurate, is in strict conformance with all contract requirements, has been thoroughly coordinated and cross checked against all other applicable disciplines to prevent the omission of vital information, that all conflicts have been resolved, and that repetition has been avoided and, it is complete and in sufficient detail to allow ready determination of compliance with contract requirements by the Contracting Officer.

Name of CQC System Manager: _____

Signature of CQC System Manager: _____

Date: _____

1.4 ENGLISH LANGUAGE

All specifications, drawings, design analysis, design calculations, shop drawings, catalog data, materials lists, and equipment schedules submitted shall be in the English language. However, the local language of host country shall be added to project as-built drawings.

1.5 UNITS OF MEASUREMENT

Design documents shall be prepared in accordance with the guidance offered in SECTION 01415 METRIC MEASUREMENTS.

The metric units used are the International System of Units (SI) developed and maintained by the General Conference on Weights and Measures (CGPM); the name International System of Units and the international abbreviation SI were adopted by the 11th CGPM in 1960.

1.5.1 Drawings

1.5.1.1 Site Layout

All site layout data shall be dimensioned in meters or coordinates, as appropriate. All details and pipe sizes shall be dimensioned in millimeters.

EXAMPLE: Masonry openings shall be a U.S. module to suit a standard U.S. door. The dimensions of the opening shall be given in SI units. Metric dimensions for site plans shall be in meters and fraction thereof. Dimensions for all other drawings shall be in millimeters using hard metric designations (example: 12 meters = 12 000). Hard metric is defined as utilizing standard metric products and the use of measurements in increments of fifty (50) and one hundred (100) millimeters.

1.5.1.2 Georeference

All site plans shall be geo-referenced using the WGS 1984 coordinate system, specifically the following: WGS 1984 UTM one 42 N. If the designer is not able to use the stated coordinate system the coordinate system used shall be correlated to the stated coordinate system. A table shall be provided within the site drawing set cross referencing the WGS84 system to that utilized. This is required to allow AED to incorporate the plans into GIS for storage, map production, and possible geospatial analysis of the different work sites.

1.5.2 Design Calculations

Calculations shall be in SI units to meet the requirements of the design. Quantities on the contract drawings stated in SI units, shall also be stated in SI units in the design analysis to match the drawings.

1.5.3 Specifications

All equipment and products shall be specified according to U.S. standards and described by appropriate units as required herein.

1.6 WITHHOLDING OF PAYMENT FOR SUBMITTALS

1.6.1 Design Submittals

Payment for Design work will not be made in whole or in part until the Government has reviewed and cleared the design for construction.

1.6.2 Construction Submittals

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. In event under separate clause of the contract, the Design-Build Contractor is allowed partial or total invoice payment for materials shipped from the Continental United States (CONUS), and/or stored at the site, the Design-Build Contractor shall with his request for such payment, submit copies of approvals (ENG Form 4025) certifying that the materials that are being shipped and/or stored have been approved and are in full compliance with the contract technical specifications.

PART 2 PRODUCTS

2.1 GENERAL

The following are contract deliverables which expound upon and finalize the design parameters/requirements outlined within the contract documents. They shall be prepared in such a fashion that the Prime Contractor is responsible to the Government and not as an internal document between the Prime Contractor and its Subcontractors, Vendors, Suppliers, etc.

2.2 PROJECT NARRATIVE

The Project Narrative shall be a bound set and shall contain the contract RFP, Sections 0101 and 01015. (add additional RFP sections that you need). The RFP Section 01010 and 01015 shall be the latest version. Any subsequent changes to the RFP shall be clearly marked and highlighted with explanation for the changes.
The Project Narrative shall also contain the general description of the project and a discussion of the design approach and design features for the project.

2.3 DESIGN ANALYSIS

2.3.1 Submittal

A design analysis, written in the English Language with SI units of measure shall be submitted for review by the Government. The design analysis is a written explanation of the project design which is expanded and revised (updated) as the design progresses. The design analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the final drawings and specifications. The design analysis contains the criteria for and the history of the project design, including criteria furnished by the Government, letters, codes, references, conference minutes, and pertinent research. Design calculations, computerized and manual, are included in the design analysis. Narrative descriptions of design solutions are also included. Written material may be illustrated by diagrams and sketches to convey

design concepts. Catalog cuts and manufacturer's data for all equipment items, shall be submitted. Copies of all previous design phase review comments and the actions assigned to them shall be included with each submission of the design analysis. Specific requirements for the design analysis, listed by submittal phase, are contained hereinafter.

2.3.2 Format

Format of design analysis shall closely match the standard format referenced within the request for proposal (RFP).

2.4 DESIGN CALCULATIONS

When they are voluminous, they shall be bound separately from the narrative part of the design analysis. The design calculations shall be presented in a clean and legible form incorporating a title page and index for each volume. A table of contents, which shall be an index of the indices, shall be furnished when there is more than one volume. The source of loading conditions, supplementary sketches, graphs, formulae, and references shall be identified. Assumptions and conclusions shall be explained. Calculation sheets shall carry the names or initials of the computer and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

2.4.1 Automatic Data Processing Systems (ADPS)

When ADPS are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies of the ADPS input data and output summaries. When the computer output is large, it may be divided into volumes at logical division points.

2.4.1.1 Computer Printouts

Each set of computer printouts shall be preceded by an index and by a description of the computation performed. If several sets of computations are submitted, they shall be accompanied by a general table of contents in addition to the individual indices.

2.4.1.2 Preparation of the Description

Preparation of the description which must accompany each set of ADPS printouts shall include the following.

a. Explain the design method, including assumptions, theories and formulae.

b. Include applicable diagrams, adequately identified.

c. State exactly the computation performed by the computer.

d. Provide all necessary explanations of the computer printout format, symbols, and abbreviations.

e. Use adequate and consistent notation.

f. Provide sufficient information to permit manual checks of the results.

2.5 SPECIFICATIONS

Specifications shall be prepared in accordance with the Construction Specifications Institute (CSI) format. The Design-Build Contractor prepared specifications shall include as a minimum, all applicable specification sections referenced by the CSI. Where the CSI does not reference a

specification section for specific work to be performed by this contract, the Design-Build Contractor shall be responsible for creating the required specification.

2.5.1 Preparation of Proprietary Non-Generic Design Documents

During the course of design, the designer shall specify specific proprietary materials, equipment, systems, and patented processes by trade name, make, or catalog number. The subsequent use of construction submittals to supplant and/or supplement incomplete design effort is unacceptable. Design submittals containing non-proprietary and/or generic design criteria where proprietary items are available, will be returned for resubmission.

2.5.2 Use of Unified Facilities Guide Specifications (UFGS)

If UFGS are used, it is the sole responsibility of the Design-Build Contractor to prepare these specifications in strict conformance with the paragraph entitled PREPARATION OF PROPRIETARY NON-GENERIC DESIGN DOCUMENTS. UFGS containing non-proprietary and/or generic design criteria, where proprietary items are available, will be returned for resubmission. If the UFGS contains a “SUBMITTALS” paragraph, the Design-Build Contractor shall delete it and incorporate all required information directly into the design documents. Under no circumstances will the Design-Build Contractor be permitted to use submittals and shop drawings to finalize an incomplete design. UFGS (Uniform Federal Guide Specifications) are required for this project when U.S. products and systems are required or used. Current UFGS information may be obtained at the following location: http://www.wbdg.org/ccb/browse_org.php?o=70.

Specifications for UFGS are in SpecsIntact format. SpecsIntact is government sponsored software used to edit specifications for government contracts. The software is available at the following link: http://specsintact.ksc.nasa.gov/index.asp.

2.5.3 Quality Control and Testing

Specifications shall include required quality control and further indicate all testing to be conducted by the Design-Build Contractor, its subcontractors, vendors and/or suppliers.

2.5.4 Ambiguities and indefinite specifications

Ambiguities, indefinite specification requirements (e.g., highest quality, workmanlike manner, as necessary, where appropriate, as directed etc) and language open to interpretation is unacceptable.

2.5.5 Industry Standards

2.5.5.1 U.S. Industry Standards

The Specifications shall be based on internationally accepted U.S. industry Standards. Customarily accepted publications may be found in the UNIFIED MASTER REFERENCE LIST (UMRL) which may be located at the following URL: http://www.hnd.usace.army.mil/techinfo/UFGS/UFGSref.htm.

To access the UMRL select the “Unified Facilities Guide Specifications” tab and scroll down to Unified Master Reference List (UMRL) (PDF version).

Examples of U.S. standards are: National Fire Protection Association (NFPA), International Building Code (IBC), American Concrete Institute (ACI), American Water Works Association (AWWA), ADAAG (ADA Accessibility Guidelines) for Buildings and Facilities, etc. Standards referenced shall be by specific issue; the revision letter, date or other specific identification shall be included.

This document lists publications referenced in the Unified Facilities Guide Specifications (UFGS) of the Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), the Air

Force Civil Engineer Support Agency (AFCESA), and the guide specifications of the National Aeronautics and Space Administration (NASA). This document is maintained by the National Institute of Building Sciences (NIBS) based on information provided by the agencies involved and the standards producing organizations. The listing is current with information available to NIBS on the date of this publication.

Standards referenced in specifications and drawings prepared by the Design-Build Contractor shall be by specific issue; the revision letter, date or other specific identification shall be included.

2.5.5.2 Non U.S. Industry Standards

If non U.S. industry standards (e.g., codes, regulations, or technical references and norms) are authorized for use under this contract and are incorporated in the Design-Build Contractor's design, one (1) copy of each standard referenced shall be provided to the Government.

Where a U.S. design and/or construction standard cannot be referenced due to non-availability of products and/or systems, another specification format using the CSI guidelines may be utilized for that particular product and/or system. If a majority of the specifications within this project reference non-U.S. products due to availability and/or other factors, the entire set of specifications are not required to be in UFGS and SpecsIntact format.

2.5.6 Incorporation of Government review comments

Subsequent to submission to the Government, the specifications shall be finalized by the incorporation of Government review comments.

2.6 DRAWINGS

Drawings, prepared in the English language with SI units of measure, are a part of each submittal. The working drawings shall be adequately labeled and cross-referenced for review. Complete, thoroughly checked and coordinated contract drawings shall be submitted. The contract drawings submitted for final review shall include the drawings previously submitted which have been revised and completed as necessary. The Design-Build Contractor shall have incorporated any design review comments generated by previous design review(s), have completed all of his constructability and coordination checks, and have the drawings in a Ready-to-Build condition. The drawings shall be complete at this time and contain all the details necessary to ensure a clear understanding of the work throughout construction.

2.6.1 Drawing Size

Project is required to be in SI units, all drawings shall be prepared in size "A1" sheets (594mm by 841mm). If project is required to be in English units, all drawings shall be modified Architectural D size (24 inches by 36 inches) sheets. Design submissions may be prepared in half size (11 inches by 17 inches) to save paper and for ease of review. All final contract drawing sets shall be prepared with full size sheets. Drawings shall be trimmed to size if necessary.

2.6.2 Computer Assisted Design and Drafting (CADD)

Computer Assisted Design and Drafting (CADD) is required for all work related to this contract. The CADD deliverables shall meet the requirements of the AEC CAD Standard Release 2.0. Emphasis is on drawings meeting sheet layout standards, level/layer naming standards and sheet naming conventions. CAD standards may be found at the following link: https://tsc.wes.army.mil/products/standards/aec/aecstdweb.asp. Transatlantic Programs Center Design Instructions Manual, Chapter 22 entitled COMPUTER ASSISTED DESIGN AND DRAFTING. The Contractor shall furnish the digital as-built drawing files in .DWG file format utilizing AutoDesk

AutoCAD revision 2004 or later. Drawings prepared in any convention other than CADD, must have approval of the Contracting Officer.

2.6.3 Plotter Prepared Original Drawings

Plotter prepared original drawings shall be prepared on 20 pound bond paper, unless otherwise approved and shall be plotted on the matte side. Raster plotters must provide a minimum resolution of 400 dpi while vector plotters shall provide a minimum resolution of 0.0010 inch with an accuracy of +0.1% of the move and a repeatability error of not more than 0.005 inch. Drawings produced from dot matrix plotters are not acceptable. Plots accompanied by the digital design file may be prepared on vellum: translucent bond is not acceptable. Line density shall be equivalent to that produced by black India ink: half-tones and gray scale plots are not acceptable unless otherwise approved. Manual changes to plotted originals are not acceptable.

2.6.4 Half-Size Reduction

Preparation of all work shall accommodate half size reduction unless project is required to meet SI units or shall be instructed otherwise by the Contracting Officer.

2.6.5 Symbols and Abbreviations

Symbols and abbreviations shall be in accordance with AEC CAD Standard Release 2.0 or later /or conform to the symbols used with a CADD program such AutoDesk AutoCAD release 2004 or greater.

2.6.6 Design Discipline Designation Format

Referencing AEC CAD Standard Release 2.0, the drawing package shall be divided into the following proposed divisions as shown in chronological order:

Use the following for AEC CAD Standard Release 2.0:

Discipline Designation	Discipline
C	Civil
A	Architectural
S	Structural
P	Plumbing
M	Mechanical
E	Electrical
F	Fire Protection

Each drawing for the particular facility shall be designated by the discipline designation and sheet number and shall be consecutive within each discipline. AEC CAD Standard, referenced herein, shall be adhered to, especially with regard to sheet naming, numbering and level/layer naming standards. Copies of level/layer naming standards are available at the following locations (in comma delimited format - .CSV) and may be imported into Microstation and/or AutoCAD release 2000 or later:

Public FTP site:
ftp://anonymous:anonymous@ftp.usace.army.mil/pub/aed/Standards/AEC_Nat_CAD_Std/level_libs/
SharePoint site:
https://aedsharepoint.tac.usace.army.mil/C16/Drawings/Document%20Library/AEC_CAD_level_templates.ZIP

2.6.7 Grouping Drawings

A building or individual facility design shall, except for site development drawings, be grouped in the design drawing package so that a single building may be withdrawn by deleting or removing a consecutive block of sheets.

2.6.8 Title and Revision Block

Title and revision block shall match FIGURES 1 through 5 furnished in the paragraph entitled ATTACHMENTS.

2.6.9 Drawing Scales

The scales indicated on the following list shall, in general, be used for all drawings. The Contractor may, at its option, make exceptions to scales indicated, if approved in writing by the Contracting Officer.

Site, Grading and Utility Plans - 1:500, if in SI units

Key Plans as large as practical

Cross Sections/elevations (as large scale as possible to adequately show required detail) - 1:100, if in SI units

Details - 1:10 minimum, if in SI units

2.6.10 Binding

All volumes of drawing prints shall be firmly bound and shall have covers of heavier bond than the drawing sheets. If posts are used to fasten sheets together, the drilled holes on the bond edges of the sheets shall be on 8-1/2-inch centers.

2.6.11 Typical Sheets

Typical sheets of standard details uniformly used on all buildings are authorized and encouraged. Sheets of standard details may be prepared so that they can be reused if the design package must be divided into separate construction packages. Each typical detail drawing sheet may be limited to a particular design discipline. Standard detail sheets shall be organized by discipline as are the other drawing sheets. Details peculiar to one facility shall not be shown in the standard details but with the group of drawings for the facility to which it pertains.

2.6.12 Index Sheet(s)

The first sheet of each volume in a project shall be a cover sheet. In general, the second sheet shall be the first index. Multiple index sheets may be required, depending on the project size. All index sheets shall be included with each volume of drawings and shall be an index of all the individual drawings in all volumes. The index shall list sequentially the site development drawings, each facility's drawings, and the standard details drawings (if any), and shall locate them by volume and file number. Each index sheet shall be signed and stamped by a principal of the Design-Build Contractor.

2.6.12 A Sheet page numbers

All discipline sheets shall be numbered in numbering sequence from 1 of #
Example: discipline =A
A
1 of 198 and followed numerically from 1 to (198 of 198)

2.6.13 Drawing File Number

The File Number is unique to each drawing and is a combination of a project location code, project number, facility designator and the CADD file name. Unassigned numbers or skipped sheets shall be labeled as "Not Used" on the index sheets. Cover sheets are not numbered.

2.6.14 Specifications Placed on the Drawings

Details of standard products or items which are adequately covered by specifications shall not be included on the drawings.

2.6.15 Legends

For each submittal, legends of symbols and lists of abbreviations shall be placed on the drawings. They shall include all of the symbols and abbreviations used in the drawing set, but shall exclude any symbols and abbreviations not used. Since many symbols are limited to certain design disciplines, there is a definite advantage to the use of separate legends on the initial sheet of each design discipline or in the Standard Details package for each discipline. If legends have not been shown by discipline, a legend shall be placed on the first drawing.

2.6.16 Location Grid

To facilitate the location of project elements and the coordination of the various disciplines' drawings, all plans shall indicate a column line or planning grid, and all floor plans (except structural plans) shall show room numbers.

2.6.17 Composite and Key Plans

If the plan of a large building or structure must be placed on two or more sheets in order to maintain proper scale, the total plan shall be placed on one sheet at a smaller scale. Appropriate key plans and match lines shall appear on segmented drawings. Key plans shall be used not only to relate large scale plans to total floor plans but also to relate individual buildings to complexes of buildings. Key plans shall be drawn in a convenient location and shall indicate the relative location of the represented plan area by crosshatching.

2.6.18 Revisions

Drawing revisions shall be prepared only on the original CADD files. A revision area is required on all sheets.

PART 3 EXECUTION

3.1 GENERAL

3.1.1 Design Concept Coordination Meeting

In addition to regular meetings with the Government the Contractor shall conduct formal status briefings on a monthly basis, as a minimum, to provide a management overview of design development. Shortly after contract award the Government may choose to conduct meetings with the Design-Build Contractor to refine proposal concept features. The purpose of the meeting is to assure attention to project requirements and to suggest ways of improving the design prior to tentative level submissions.

3.1.2 Government Design Changes

Government design changes which do not increase construction costs shall be made at no charge to the Government. The Contracting Officer may request design submittals in addition to those listed when deemed necessary to adequately describe the work covered in the contract documents. Submittals shall be made in the respective number of copies and to the respective addresses set forth in the paragraph entitled SUBMITTAL PROCEDURE. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

3.2 SUBMITTAL REGISTERS

3.2.1 Contractor-Furnished Design Documents Submittal Register (TAC Form 122-E)

3.2.1.1 General

The Contractor shall submit as part of his Project Schedule, information regarding the submittal and clearance for construction of Contractor furnished design documents. In addition, the Contractor shall provide a complete submittal register in the sample format (TAC Form 122-E - Contractor Furnished Design Documents Submittal Register) which is attached to this section. The Contractor shall, within fifteen (15) calendar days after approval of the Project Schedule, submit 3 copies of his finalized Contractor Furnished Design Document Submittal Register to the Contracting Officer for approval. The submittal register shall consist of a tabulation of all the Contractor furnished design documents with the indicated dates integrated into the Design Progress Schedule. The Contractor shall post all actual dates of submittal actions (including clearance for construction) as they occur.

3.2.1.2 Additions or Revisions

Any additions or changes required to be made to the TAC Form 122-E as a result of the Contracting Officer's review shall be incorporated into the TAC Form 122-E by the Contractor and a re-submittal of 35% and 100% design submittald and (3) copies shall be affected within five (5) calendar days after receipt of the Contracting Officer's review comments.

3.2.1.3 Submission Requirements

A copy of the initial TAC Form 122-E and each monthly update prepared by the Contractor, shall be submitted to

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District
House # 1, St. #1 West
West Wazir Akbar High School
Behind Amani High School
Kabul, Afghanistan
Attn.: Tony Lijewski

(2) U.S. Postal Service:
U.S. Army Corps of Engineers
Afghanistan Engineer District (CEAED-EC)
Attn.: Qalaa House
APO AE 09356]

TRANSATLANTIC PROGRAMS CENTER

U.S. Army Corps of Engineers
Transatlantic Programs Center (CETAC-EC-TT-QC Attn: Judy Funkhouser)

201 Prince Frederick Drive
Winchester, Virginia 22602

3.2.2 Construction Submittal Register (ENG Form 4288)

Attached to this section is ENG Form 4288 which the Contractor is responsible for developing for this contract. All construction submittals shall be shown on this register. The submittal register shall be the controlling document and will be used to control all construction submittals throughout the life of the contract. The Contractor shall maintain and update the register on a monthly basis for the Contracting Officer's approval.

3.3 TRANSMITTAL FORM (ENG Form 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both design and construction submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care will be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.4 PROGRESS SCHEDULE

The Contractor shall prepare and submit a design progress schedule to the Contracting Officer. The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The progress schedule shall show, as a percentage of the total design price, the various items included in the contract and the order in which the Contractor proposes to carry on the work, with dates on which he will start the features of the work and the contemplated dates for completing same. Significant milestones such as review submittals shall be annotated. The Contractor shall assign sufficient technical, supervisory and administrative personnel to insure the prosecution of the work in accordance with the progress schedule. The Contractor shall correct the progress schedule at the end of each month and shall deliver Submittal section AED (3) copies to the Contracting Officer. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.5 SCHEDULING

3.5.1 Design Submittals

Adequate time (a minimum of fourteen (14) calendar days exclusive of mailing time) shall be allowed for review and clearance for construction. If the Contractor fails to submit design submittals in a timely fashion, or repetitively submits design submittals that are not in strict conformance with the contract documents, no part of the time lost due to such actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.5.2 Post Design Construction Submittals

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of fourteen (14) calendar days exclusive of mailing time) shall be allowed for review and approval. If the Contractor fails to submit post design construction submittals in a timely fashion, or repetitively submits submittals that are not in strict conformance with the contract documents, no part of the time lost due to actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.6 SUBMITTAL PROCEDURE

3.6.1 Design Submittals

3.6.1.1 Afghanistan Engineer District (AED)

Two (2) hard copies and one soft copy_(1) copies of all design submittals shall be transmitted to the Government at the following address by means of ENG Form 4025:

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District
House # 1, St. #1 West
West Wazir Akbar High School
Behind Amani High School
Kabul, Afghanistan
Attn.:__[_____]

(2) U.S. Postal Service:
U.S. Army Corps of Engineers
Afghanistan Engineer District (CEAED-EC)
Attn.: Qalaa House
APO AE 09356

TRANSATLANTIC PROGRAMS CENTER

U.S. Army Corps of Engineers
Transatlantic Programs Center
ATTN: CETAC-EC-TT-QC (J. Funkhouser)
201 Prince Frederick Drive
Winchester, Virginia 22602

One (1) set of designs (3) copies of all design submittals shall be transmitted to the Government at the following address by means of ENG Form 4025:

TRANSATLANTIC PROGRAMS CENTER

U.S. Army Corps of Engineers
Transatlantic Programs Center
ATTN: CETAC-EC-TT-QC (J. Funkhouser)
201 Prince Frederick Drive
Winchester, Virginia 22602

The drawings shall be submitted in full size and half size formats unless otherwise noted.

For the Afghanistan Engineer District and/or field office, the Contractor shall submit two (1) full size and one (2) half size sets of drawings and a complete set of specification, design analysis and a soft copy on CD-ROM of all of the listed herein.

3.6.1.2 Resident/Area Engineer Office

Two (2) half sizs copies and one (1) full size additional copy of each design submittal shall be transmitted to the overseas field office administering the construction portion of the contract at the following address:

Transatlantic Program Center

The drawings shall be submitted in electronic file format unless otherwise noted.

3.6.1.3 Deliverables "Cleared for Construction"

Once the Design Documents have been "Cleared for Construction" by the Contracting Officer, the Design-Build Contractor shall clearly identify each document by annotating it as “Cleared for Construction”. One (1) complete hardcopy and CD set of all finalized design documents shall be submitted to the Government as follows:

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District
House # 1, St. #1 West
West Wazir Akbar High School
Behind Amani High School
Kabul, Afghanistan
Attn: Engineering Section

(2) U.S. Postal Service:
U.S. Army Corps of Engineers
Afghanistan Engineer District (CEAED-EC)
Attn.: Qalaa House
APO AE 09356

TRANSATLANTIC PROGRAMS CENTER
U.S. Army Corps of Engineers
Transatlantic Programs Center
ATTN: CETAC-EC-TT-QC (J. Funkhouser)
201 Prince Frederick Drive
Winchester, Virginia 22602

Resident Area Engineer Office AED

Field office or site location of design project.

This is a Design-Build project and in accordance with Contract Clause 52.227-7022 GOVERNMENT RIGHTS (UNLIMITED), the Government has non-exclusive rights to use the design on other projects. Therefore, the As-Builts furnished to the Government must be in an editable format.

3.6.1.4 Editable CADD Format As-Builts

In accordance with section 01060 SPECIAL CLAUSES clause PREPARATION OF AS-BUILT DRAWINGS (CONTRACTOR), one (1) set of the Government approved As-Builts shall be submitted to the following address in an editable CADD format:

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District
House # 1, St. #1 West
West Wazir Akbar High School
Behind Amani High School

Kabul, Afghanistan
Attn: Engineering Section

(2) U.S. Postal Service:
U.S. Army Corps of Engineers
Afghanistan Engineer District (CEAED-EC)
Attn.: Qalaa House
APO AE 09356

This requirement is in addition to all other submission requirements stated elsewhere in the contract.

3.6.1.5 Digital Transmission of Design Submittals

The Design-Build Contractor shall submit design deliverables addressed by this specification in digital format. The following procedure shall be followed:

a. USE OF FILE TRANSFER PROTOCOL (FTP) SERVER. The Design-Build contractor will download all design files on either its own File Transfer Protocol (FTP) Server, the Corps FTP Server or as otherwise directed. Afghanistan Engineer District (AED) prefers that the contractor provide the soft copy of design submittals be burned to CD-ROM and submitted as such. The procedure to be followed will be established at the Pre-Construction Conference and the appropriate log-in and password information will be exchanged between the Government and the Design-Build Contractor.

NOTE: AED accepts AutoCad release 2004 or higher drawing file format as the standard due to the fact that the local region does not support Microstation

b. TRANSLATED OR CONVERTED FILES DRAWING FILES. Digital drawing files shall be prepared as indicated in the paragraph entitled COMPUTER ASSISTED DESIGN AND DRAFTING (CADD). Under NO circumstances shall the Design-Build Contractor translate (or convert) the files from AutoDesk AutoCAD to Bentley Microstation.

c. NOTIFICATION. The Design-Build Contractor shall notify all recipients by email that the Design submittal has been downloaded to the designated FTP server or electronically provided on a CD and is ready for Government review. This email shall include a scanned copy of the ENG Form 4025 signed by the Design-Build Contractor's Contractor Quality Control (CQC) Organization. It shall also include an updated digital copy of TAC Form 122-E. The Government will use the digital submittal as an advance copy pending receipt of an official hardcopy version in accordance with the paragraph entitled SUBMITTAL PROCEDURE. Subsequent to a period of demonstrated successful performance, the Government may elect to eliminate the requirement to submit an official hardcopy version.

The TAC Form 122-E shall be prepared in a spread sheet software that readily allows the file to be saved as a *.CSV file that can subsequently be imported into the Corps of Engineers Resident Management System (RMS) software.

d. RETURN OF GOVERNMENT REVIEWED SUBMITTALS. Subsequent to the Government review, the Eng Form 4025 with comments (if applicable) will be returned to the Design-build Contractor digitally by email. Hardcopies of these documents will subsequently be submitted to the Design-Build Contractor via the United States Postal Service (USPS). The Government may elect to stop sending hardcopies if it deems that digital transmission of design submittals is progressing satisfactorily.

e. SUPPLEMENTAL ACTIONS. All supplemental actions, resubmittals, and subsequently scheduled submissions shall be performed by the Design-Build contractor as indicated within this paragraph.

AED: As-builts shall be prepared and submitted in .DWG format utilizing AutoDesk AutoCad release 2004 or higher format.

3.6.2 Post Design Construction Submittals

Three (3) copies of all post design construction submittals shall be transmitted to the overseas district office administering the construction portion of the contract at the following address:

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District
House # 1, St. #1 West
West Wazir Akbar High School
Behind Amani High School
Kabul, Afghanistan
Attn: Engineering Section

(2) U.S. Postal Service:
U.S. Army Corps of Engineers
Afghanistan Engineer District (CEAED-EC)
Attn.: Qalaa House
APO AE 09356

Submittal area of the AED engineering section

One (1) additional copy of each Post Design Construction submittal shall be transmitted to the Government at the following stateside address by means of ENG Form 4025:

TRANSATLANTIC PROGRAMS CENTER

U.S. Army Corps of Engineers
Transatlantic Programs Center
ATTN: CETAC-EC-TT-QC (J. Funkhouser)
201 Prince Frederick Drive
Winchester, Virginia 22602

Shop Drawing section

Submittals of Operations and Maintenance (O & M) Manuals in sets of (3) three copies shall be as follows:

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District
House # 1, St. #1 West
West Wazir Akbar High School
Behind Amani High School
Kabul, Afghanistan
Attn: Engineering Section

(2) U.S. Postal Service:

U.S. Army Corps of Engineers
Afghanistan Engineer District (CEAED-EC)
Attn.: Qalaa House
APO AE 09356

3.6.3 Submittal Numbering System

Instructions on the numbering system to be used for construction submittals follows:

3.6.3.1 Submittals

Shop drawings and materials are listed on the Submittal Register (ENG Form 4288) as follows:

a. List is prepared according to contract specifications and drawings, picking up all items involved in the project.

b. This list is divided into sections as indicated in the specifications for example:

Sec 01015 "Technical Requirements"
Sec 01335 "Design Submittals
Sec. 02831 "Chain-Link Fence"
Sec. 02710 "Subdrainage System"
Sec 03300 "Concrete For Building Construction"
Sec. 04200 "Masonry"

3.6.3.2 Numbering procedures for transmittal on ENG FORM 4025

a. Each section, may include a list of items. All these items will then be listed with a progressive number within the sections they belong to, for example:

Sec. 01015 will have 01015.00 (Basic number)
Item x " " 01015.01
Item y " " 01015.02
Item z " " 01015.03

Sec. 01335 will have 01335.00 (Basic number)
35% design drawings " " 01335.01
100% design drawings " " 01335.03

Sec. 02710 will have 02710.00 (Basic number)
Item x " " 02710.01
Item y " " 02710.02
Item z " " 02710.03

Sec. 02600 will have 02600.00 (Basic number)
Item x " " 02600.01
Item y " " 02600.02

Sec. 03300 will have 03300.00 (Basic number)
Item x " " 03300.01
Item y " " 03300.02
etc.

b. It is evident a transmittal will never show a Section number i.e., 02831.00, 03300.00, etc., since these are only the basic numbers of the system. Numbers on transmittals will be the item numbers, i.e., 01015.01, 02710.01, 02710.02, 02710.03, 03300.01, 03300.02, etc. All items, as listed on the

Submittal Register, will be submitted via a separate transmittal form ENG FORM 4025 thus avoiding getting together more than one item (as listed) and more than one number. There are items, on the other hand, which may be submitted all together on the same transmittal form. This must be established before submission is made.

c. Sec. 10800 "Toilet Accessories" - this section will have basic number 10800.00 - all items relative to it will be listed one by one on separate lines. ONLY one transmittal number will then be given for all of these "10800.01" which will include i.e., robe hook, toilet paper holder, mirror, soap holder, cabinet for paper towels, etc. Each one of these items will be listed on the same Transmittal Number 10800.01 as item 1, item 2, item 3, etc.

For design reviews the standard Corps of Engineers method of review is through DrChecks through projnet https://www.projnet.org/projnet/binKornHome/index.cfm All of AED design submittal reviews shall be done through DrChecks.

3.6.3.3 Resubmittals

Should the Contractor be required to resubmit any transmittal, it will be accomplished by utilizing the same transmittal number followed by the number "-1" for the first resubmittal, "-2" for the second resubmittal, "-3" for the third resubmittal, etc. For example, a first resubmittal would be "SUBMITTAL PROCEDURES FOR DESIGN BUILD PROJECT" 01335.01-1, a second resubmittal 01335.01-2, etc. The purpose of this system is to avoid deviations from Submittal Register and, to avoid confusion arising from the use of more than one number on transmittal when more than one item is submitted on the same form. This system will also facilitate the use, wherever required, on machine printouts.

3.6.4 Variations

If design documents or construction submittals show variations from the contract parameters and/or requirements, the Contractor shall justify such variations in writing, at the time of submission. Additionally, the Contractor shall also annotate block "h" entitled "variation" of ENG FORM 4025. After design submittals have been reviewed and cleared for construction by the Contracting Officer, no resubmittal for the purpose of substituting materials, equipment, systems, and patented processes will be considered unless accompanied by the following:

a. Reason or purpose for proposed variation, substitution, or revision.

b. How does quality of variation compare with quality of the specified item? This shall be in the form of a technical evaluation tabulating differences between the item(s) originally specified and what is proposed.

c. Provide a cost comparison. This shall include an acquisition and life cycle cost comparison.

d. For proprietary materials, products, systems, and patented processes a certification signed by an official authorized to certify in behalf of the manufacturing company that the proposed substitution meets or exceeds what was originally specified.

e. For all other actions, a certification signed by a licensed professional engineer or architect certifying that the proposed variation or revision meets or exceeds what was originally specified.

f. Advantage to the Government, if variation is approved, i.e. Operation and Maintenance considerations, better product, etc.

g. Ramifications and impact, if not approved.

If the Government review detects any items not in compliance with contract requirements or items requiring further clarification, the Contractor will be so advised. Lack of notification by the Contracting Officer of any non-complying item does not relieve the Contractor of any contractual obligation.

3.6.5 Non-Compliance

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.7 REVIEW OF CONTRACTOR PREPARED DESIGN DOCUMENTS

3.7.1 General

The work under contract will be subject to continuous review by representatives of the Contracting Officer. Additionally, joint design review conferences with representation by all organizations having a direct interest in the items under review may be held. The Design-Build Contractor shall furnish copies of all drawings and related documents to be reviewed at the review conference on or before the date indicated by the Government. Additional conferences pertaining to specific problems may be requested by the Design-Build Contractor or may be directed by the Contracting Officer as necessary to progress the work. The Design-Build Contractor shall prepare minutes of all conferences and shall furnish two copies to the Contracting Officer within seven (7) days after the conference.

3.7.2 Independent Design Review

The Design-Build Contractor shall have someone other than the Designer or Design Team perform an independent review of all specifications, drawings, design analysis, calculations, and other required data prior to submission to the Government. Upon completion of this review, the Design-Build Contractor shall certify that each design submittal is complete, accurate, is in strict conformance with all contract requirements, that repetition has been avoided, that all conflicts have been resolved, and that the documents have thoroughly coordinated and cross checked against all the applicable disciplines to prevent the omission of vital information.

3.7.3 Contractor's Quality Control Organization Review

This review shall be for the purposes of eliminating errors, interferences, and inconsistencies, and of incorporating design criteria, review comments, specifications, and any additional information required. Design submittals submitted to the Contracting officer without evidence of the Contractor's certified approval will be returned for resubmission. No part of the time lost due to such resubmissions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

Action Code on Eng Form 4025 the “G – Other (specify)" Code must be used. ENG Forms 4025 and 4026 will be annotated as follows:

G – Cleared for Construction

G – Cleared for Construction, except as noted in attached comments

G – Cleared for Construction, except as noted in attached comments, resubmission required

G -- NOT Cleared for Construction, see attached comments, resubmission required

FX – Receipt acknowledged, does not comply as noted with contract requirements.

NOTE: Cleared for construction does not relieve the Design-Build Contractor from the responsibility for any errors or omissions in the design, nor from responsibility for complying with the requirements of this contract.

3.7.4 Government Review

Within 14 days after Notice to Proceed, the Contractor shall submit, for approval, a complete design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly. After receipt, the Government will be allowed fourteen (14) days to review and comment on the 35% a design submittal and fourteen (14) days to review and comment on the 100% design submittal, except as noted below. For each design review submittal, comments from the various design sections and from other concerned agencies involved in the review process will be made in the on-line review management system DrChecks$_{SM}$ (https://www.projnet.org/projnet/binKornHome/index.cfm). Contractor shall coordinate with the Contracting Officer and/or Representative(s) to register for DrChecks$_{SM}$ use. The review will be for conformance with the technical requirements of the solicitation and the Successful Offeror's (Contractor's) RFP proposal.

If a design submittal is deficient, it will be returned for correction and resubmission. The review time will begin when the corrected submittal is received.] The design-build contractor may be liable for liquidated damages owed to the Government for returned design submittals due to deficiencies.

[The contractor shall not begin construction work until the Government has reviewed the contractor's design and has cleared it for construction. Clearance for construction does not mean Government approval. Government review shall not be construed as a complete check but will evaluate the general design approach and adherence to contract parameters. The Government Review is often limited in time and scope. Therefore, the Contractor shall not consider any review performed by the Government as an excuse for incomplete work. Upon completion of the review, all comments will be forwarded to the Contractor. The Contracting Officer will indicate whether the design submittal has or has not been cleared for construction using the following action codes:

A – Cleared for Construction

B – Cleared for Construction, except as noted in attached comments

C – Cleared for Construction, except as noted in attached comments, resubmission required

E - NOT Cleared for Construction, see attached comments, resubmission required

FX – Receipt acknowledged, does not comply as noted with contract requirements.

These codes shall NOT be used by the Design-Build Contractor. Design-Build Contractor’s Quality Control Organization will annotate Block “g” entitled “FOR CONTRACTOR USE CODE” of Eng Form 4025-R using the action codes listed on the reverse side of the form.

Design submittals Cleared for Construction by the Contracting Officer shall not relieve the Contractor from responsibility for any design errors or omissions and any liability associated with such errors, nor from responsibility for complying with the requirements of this contract.

3.7.4.1 Incorporation of Government Review Comments

If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after close of review period in order that the comment can be resolved. The Contractor shall furnish disposition of all comments in DrChecks$_{SM}$, with the next scheduled submittal. The disposition shall identify action taken with citation of location within the relevant design document. Generalized statements of intention such as "will comply" or "will revise the specification" are not acceptable. The Contractor is cautioned that if he believes the action required by any comment exceeds the requirements of this contract, that he should flag the comment in DrChecks$_{SM}$ as a scope change, and notify the COR in writing immediately. If a design submittal is over one (1) day late in accordance with the latest design schedule, the Government review period may be extended 7 days. Submittals date revisions must be made in writing at least five (5) days prior to the submittal. During the design review process, comments will be made on the design submittals that will change the drawings and specifications. The Government will make no additional payments to the Contractor for the incorporation of comments. Review comments are considered part of the design-build process.

The Contractor will be furnished comments from the various design sections of the Corps of Engineers, Afghanistan Engineer District (AED) and / or Europe District (EUD) and / or Transatlantic Programs Center (TAC), as well as from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements and parameters of the contract documents. The Contractor shall either incorporate each comment or, if the Contractor disagrees technically and does not intend to comply with the comment(s), the contractor shall clearly outline, with ample justification, its reasons for its noncompliance within five (5) days after receipt of the comment(s). Additionally, the Contractor is cautioned in that if it believes the action required by any comment exceeds the requirements of this contract, that he should take no action and notify the Contracting Officer in writing immediately. The disposition of all comments shall be furnished in writing with the next scheduled submittal. The review comments and the submittal material for each design review will become the basis for any ensuing design work. Copies of the design review comments with the action taken on each comment noted, shall be bound in all succeeding volumes of the design analysis.

3.7.4.2 Conferences

As necessary, conferences will be conducted between the Design-Build contractor and the Government to resolve review comments.

A review conference will be held for each design submittal. The review conference will be held at the Corps District Office in Kabul, Afghanistan. The Contractor shall bring the personnel that developed the design submittal to the review conference.

3.7.4.3 Design Deficiencies

Design deficiencies noted by the Government shall be corrected prior to the start of design for subsequent features of work which may be affected by, or need to be built upon, the deficient design work.

3.7.5 Design Discrepancies

The Design-Build Contractor shall be responsible for the correction of incomplete design data, omissions, and design discrepancies which become apparent during construction. The Design-Build Contractor shall provide the Contracting Officer with a proposed recommendation for correcting a design error, within three (3) calendar days after notification by the Contracting Officer. The Contracting Officer will notify the Design-Build Contractor of any detected noncompliance with the foregoing requirements. The Design-Build Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Design-Build Contractor at the worksite,

shall be deemed sufficient for the purpose of notification. If the Design-Build Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Design-Build Contractor. Should extensions of design, fabrication plans and/or specific manufacturer's details be required as a result of a Government issued Change Order, the Government will make an equitable adjustment in accordance with Contract Clause 52.243-4 entitled CHANGES.

3.8 Phased or "Fast-Track" Design

3.8.1 General

If approved by the Government, design and construction sequencing may be effected on an incremental basis as each approved phase or portion (e.g., demolition, geotechnical, site work, exterior utilities, foundations, substructure, superstructure, exterior closure, roofing, interior construction, mechanical, electrical, etc.) of the design is completed.

3.8.1.1 Design Phases

Complete or partial design phasing may or may not have been specified by the Government elsewhere in this contract. For construction sequencing or phasing that the Government has not specifically mandated, the Design-Build Contractor may submit a proposed phasing plan. Design phasing proposed by the Design-Build Contractor shall be submitted to the Government for approval in accordance with TAC Form 122-E CONTRACTOR FURNISHED DESIGN DOCUMENTS.

3.8.2 Sequence of Design-Construction (Fast-Track)

After receipt of the Contract Notice to Proceed (NTP) the Contractor shall initiate design, comply with all design submission requirements and obtain Government review of each submission. The contractor may begin construction on portions of the work for which the Government has reviewed the final design submission and has determined satisfactory for purposes of beginning construction. The Contracting Officer will notify the Contractor when the design is cleared for construction. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the Government, the initial submission failed to meet the minimum quality requirements as set forth in the contract.

3.8.3 Notice-to-Proceed for Limited Construction

If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed Final Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Government.

3.8.4 In-Place Construction Payment

No payment will be made for any in-place construction until all required submittals have been made, reviewed and are satisfactory to the Government.

3.8.5 Commencement of Construction

Construction of work may begin after receipt of the clearance for construction (Notice to Proceed) for each design phase. Any work performed by the Contractor prior to receipt of the clearance for construction, shall be at the Contractor's own risk and expense. Work cleared for construction that does not conform to the design parameters and/or requirements of this contract shall be corrected by the Contractor at no additional cost or time to the Government.

3.9 DESIGN STAGES

The Contractor shall schedule the number and composition of the design submittal phases. Design submittals are required at the Concept (35%) and Final 99% design stages and at the 100% Ready-to-Advertise stage. The requirements of each design stage are listed hereinafter. The number and contents of the design submittals phases shall be reflected in TAC Form 122-E as well as in the Contractor's design progress schedule.

3.9.1 Concept Review Submittal (35%)

The review of this submittal is primarily to ensure that the Contractor has taken an inventory of the existing conditions at each proposed site, has established the most desirable functional relationships between the various project elements, has provided the technical solution to how the functional and technical requirements will be met, and to show Contractor compliance (or justify noncompliance) with the design parameters and/or requirements. Refer to requirements herein for specific submittal requirements. The following documents shall be submitted:

Site topographic survey
Grading plan
35% drawings for site plan, grading, utilities
35% drawings for buildings, facilities
List of Specification Sections to be used
Preliminary design analysis

3.9.2 Final Review Submittal 100%

The review of this submittal is to insure that the design is in accordance with directions provided the Contractor during the design process. The only effort remaining between the FINAL DESIGN REVIEW SUBMITTAL and the "CLEARED FOR CONSTRUCTION" DESIGN REVIEW SUBMITTAL is the incorporation of the Government Review Comments. The Contractor shall submit the following documents for Final review:

a. Design Analysis, developed to a 99% design stage. The Design Analysis shall be in its final form. It shall include all backup material previously submitted and revised as necessary. All design calculations shall be included. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the Final Drawings and Specifications.

b. 99% Complete Construction Specifications. The Draft Specifications on all items of work submitted for Final Review shall consist of marked-up proprietary specifications.

c. 99% Complete Construction Drawings. The Contract Drawings submitted for Final Review shall include the drawings previously submitted which have been revised and completed as necessary. The Contractor is expected to have completed all of his coordination checks and have the drawings in a design complete condition. The drawings shall be finalized at this time including the incorporation of any design review comments generated by the Preliminary design review. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction.

d. The Government's 35% and 100% Design Review Comments with the Contractor's annotation to each comment.

3.9.4 "Cleared for Construction" Design Review Submittal (100%)

After the FINAL DESIGN REVIEW SUBMITTAL review, the Contractor shall revise the Contract Documents by incorporating any comments generated during the FINAL DESIGN REVIEW

SUBMITTAL and shall prepare final hard copy Construction Specifications. The Contractor shall submit the following documents for the design complete submittal:

a. Design Analysis

b. Construction Specifications

c. Construction Drawings

d. A soft copy (CD) of the design drawings, specifications, and design analysis shall be submitted at this stage and all other subsequent stages of the design process.

e. The Government's FINAL (99%) DESIGN REVIEW SUBMITTAL comments with the Contractor's annotation to each comment.

Once the design documents have been "Cleared for Construction" by the Contracting Officer, the Design-Build Contractor shall clearly identify each document by annotating it as "Cleared for Construction."

3.9.5 Partial Design Submittals

In the interest of expediting construction, the Contracting Officer may approve partial design submittals, procurement of materials and equipment, as well as issue the Notice To Proceed (NTP) for construction of those elements of the design which have been cleared for construction. Such partial notices to proceed shall be solely at the discretion of the Contracting Officer.

3.9.6 Design Submittals not in compliance with the contract documents

The Contractor shall, without additional compensation, correct or revise any errors or deficiencies in its design analysis, specifications, and drawings, and promptly furnish a corrected submittal in the form and number of copies as specified for the initial submittal. No part of the time lost due to such resubmissions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice shall be given promptly to the Contracting Officer.

3.10 GENERAL DESIGN INSTRUCTIONS

3.10.1 Responsibility of the Design-Build Contractor

3.10.1.1 Professional Quality, Technical Accuracy, and Coordination

The Design-Build Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all design specifications, drawings, and other services furnished under this contract. Work must be organized in a manner that will assure thorough coordination between various details on drawings, between the various sections of the specifications, and between the drawings and specifications. The Design-Build Contractor shall thoroughly cross-check and coordinate all work until he is professionally satisfied that no conflicts exist, vital information has not been omitted, and that indefinite language open to interpretation has been resolved.

3.10.1.2 Deviating From The “Cleared-For-Construction” Design

(a.) The Contractor must obtain the approval of the Designer of Record (DOR) and the Government’s concurrence for any Contractor proposed revision to the professionally stamped and sealed design reviewed and Cleared for Construction by the Government, before proceeding with the revision.

(b.) The Government reserves the right to non-concur with any revision to the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and cleared for construction design.

(c.) Any revision to the design, which deviates from the contract requirements (i.e., the RFP and the accepted proposal), will require a modification, pursuant to the Changes clause, in addition to Government concurrence. The Government reserves the right to disapprove such a revision.

(d.) Unless the Government initiates a change to the contract requirements, or the Government determines that the Government furnished design criteria are incorrect and must be revised, any Contractor initiated proposed change to the contract requirements, which results in additional cost, shall strictly be at the Contractor's expense.

(e.) The Contractor shall track all approved revisions to the reviewed and cleared for construction design and shall incorporate them into the as-built design documentation, in accordance with section 01060 SC entitled PREPARATION OF AS-BUILT DRAWINGS (CONTRACTOR). The Designer of Record shall document its professional concurrence on the As-Builts for any revisions by affixing its stamp and seal on the drawings and specifications.

3.10.1.3 Government Oversight

The extent and character of the work to be done by the Design-Build Contractor shall be subject to the general oversight, supervision, direction, control, and review by the Contracting Officer.

3.10.1.4 Unlimited Drawing Rights

The Government shall have unlimited rights in all drawings, designs, specifications, notes and all other works developed in the performance of this contract, including the right to use same on any other Government design or construction without additional compensation to the Design-Build Contractor. The Design-Build Contractor hereby grants to the Government a paid-up license throughout the world to all such works to which he may assert or establish any claim under design patent or copyright laws.

3.10.1.5 Conflicts

Any conflicts, ambiguities, questions or problems encountered by the Design-Build Contractor in following the criteria shall be immediately submitted in writing to the Contracting Officer with the Design-Build Contractor's recommendations. Prior to submission to the Government the Design-Build Contractor shall take appropriate measures to obtain clarification of design criteria requirements, to acquire all pertinent design information, and to incorporate such information in the work being performed.

3.10.1.6 Design Specialists

Whenever a design specialist is required, the Design-Build Contractor shall submit for the approval by Contracting Officer, the name of the designated specialist along with the individual's educational background, experience, and licenses or registrations held, before design work commences. The design specialists shall be registered architects, registered professional engineers, or recognized consultants with a background of at least five (5) years design experience in the appropriate specialty. Services of design specialists may be required for the following specialties:

Fire Protection	Landscape Design
Medical Design	Stage/Theater Design
Acoustical Design	Interior Design
Educational Design	Security
Telecommunications	Audio Visual, PA, TV, etc.

Geotechnical Design	Hardened Structures
Asbestos Abatement	X-Ray Shielding
EMF Shielding	Site grading

3.10.2 Conduct of Work

In the performance of contract the Design-Build contractor shall:

3.10.2.1 Performance

Perform the work diligently and aggressively, and promptly advise the Contracting Officer of all significant developments.

3.10.2.2 Telephone Conversations

Prepare a summary, and promptly furnish a copy thereof to the Contracting Officer, of all telephone conversations relating to the design work under this contract.

3.10.2.3 Cooperation with Others

Cooperate fully with other firms, consultants and contractors performing work under the program to which this contract pertains, upon being advised by the Contracting Officer that such firms or individuals have a legitimate interest in the program, have need-to-know status, and proper security clearance where required.

3.10.2.4 Technical Criteria

All designs, drawings, and specifications shall be prepared in accordance with the contract documents and with the applicable publications referenced therein. As soon as possible, the Design-Build Contractor shall obtain copies of all publications applicable to this contract. Availability of publications (where to purchase) is contained in Specification Section 01420 entitled: SOURCES FOR REFERENCE PUBLICATIONS. Any deviations from the technical criteria contained in the contract documents or in the applicable publications, including the use of criteria obtained from the user or other sources, must receive prior approval of the Contracting Officer. Where the technical criteria contained or referred to herein are not met, the Design-Build Contractor will be required to conform his design to the same at his own time and expense.

3.10.3 Design Priorities

The design of this project shall consider the remote location and harsh environment of this project and the impact this will have on sources of technical supply, the cost of construction, the low level of maintenance, and the difficulty of obtaining replacement parts. Unless stated otherwise in this contract, the following design priorities shall be followed:

3.10.3.1 CONSTRUCTION LIFE-SPAN LEVELS

Permanent Construction. Buildings and facilities shall be designed and constructed to serve a life expectancy of more than 25 years, to be energy efficient, and to have finishes, materials, and systems that are low maintenance and low life-cycle cost.

Semi permanent Construction. Buildings and facilities shall be designed and constructed to serve a life expectancy of more than 5 years but less than 25 years, to be energy efficient, and to have finishes, materials, and systems that require a moderate degree of maintenance using the life-cycle cost approach.

Temporary Construction. Buildings and facilities shall be designed and constructed to serve a life expectancy of 2 years or less using low-cost construction, with finishes, materials, and systems that are selected with maintenance factors being a secondary consideration.

Mobilization, Emergency and Contingency Operations Construction. Buildings and facilities shall be designed and constructed to serve a specific mobilization or emergency requirement. Buildings will be austere to minimize construction time and maximize conservation of critical materials. Maintenance factors and longevity will be secondary considerations.

3.10.3.2 Operability

Systems including but not necessarily limited to mechanical, electrical, communications, etc., must be simple to operate and easy to maintain.

3.10.3.3 Standardization

Use of standardized materials, products, equipment, and systems is necessary to minimize the requirements for replacement parts, storage facilities, and service requirements.

3.10.3.4 Overseas Work

Use of construction materials or techniques shall be utilized which are suitable for overseas work in harsh climates and environments.

3.10.4 Topographic Surveys, Easements, and Utilities

Unless otherwise stated in the contract, the Design-Build Contractor will be responsible for detailed topographic mapping, available easements, and utility information for the project.

3.10.4.1 Horizontal and Vertical Control

The mapping shall be based on the base coordinate system. If the base system cannot be found, the surveyor shall use any established monuments. If monuments have been destroyed or do not exist, an assumed horizontal and vertical datum shall be established, using arbitrary coordinates of 10,000n and 10,000e and an elevation of 1,000 meters. The horizontal and vertical control established on site shall be a closed loop with third order accuracy and procedures. Provide three (3) concrete survey monuments at the survey site. All of the control points established at the site shall be plotted at the appropriate coordinate point and shall be identified by name or number, and adjusted elevations. The location of the project site, as determined by the surveyor shall be submitted in writing to the Contracting Officer. The site location shall be identified by temporary markers, approved by the Contracting Officer before proceeding with the surveying work.

3.10.4.2 Topography Requirements

A sufficient quantity of horizontal and vertical control shall be established to provide a detailed topographic survey at 1:500 scale with one quarter meter contour intervals minimum. Intermediate elevations shall be provided as necessary to show breaks in grade and changes in terrain.

The contours shall accurately express the relief detail and topographic shapes. In addition, 90 percent of the elevations or profiles interpolated from the contours shall be correct to within one-half of the contour interval and spot elevations shall be correct within plus or minus 20 millimeters.

Spot elevations affecting design of facilities shall be provided. Specifically, break points or control points in grades of terrain such as tops of hills, bottoms of ditches and gullies, high bank elevations, etc.

All surface and sub-surface structures features within the area to be surveyed shall be shown and identified on the topographic maps. In addition, these features shall be located by sufficient distance ties and labeled on the topographic sheets to permit accurate scaling and identification.

The location and sizes of potable, sanitary, electrical and mechanical utilities within the survey site shall be shown on the survey map. Sanitary manholes and appurtenances shall show top elevations and invert elevations.

3.10.5 Geotechnical Investigation

Unless otherwise stated in the contract, the Design-Build Contractor will be responsible for Geotechnical investigation, including subsurface explorations, sampling, field and laboratory testing, and water studies where applicable.

3.10.6 Cathodic Protection and Earth Resistance

Unless otherwise stated in the contract, the Design-Build Contractor will be responsible for determining whether cathodic protection on buried structures and underground utility systems are needed for special electrical grounding and counterpoise systems, and for gathering the field data necessary for design.

3.10.7 Water Supply and Quality Data

Unless otherwise stated in the contract, the Design-Build Contractor will be responsible for obtaining all water supply and water quality data. This data will include information on the locations and depths of all viable water supply sources at the site(s) involved and a water quantity and water quality analysis for each source.

3.10.8 Occupational Safety and Health Act

The facilities, systems, and equipment designed under this contract shall comply with the Occupational Safety and Health Act (OSHA), Code of Federal Regulations, Title 29, Chapter XVII, Parts 1910 and 1926. Any problems in incorporating these standards due to conflicts with other technical criteria shall be submitted to the Contracting Officer for resolution.

3.10.9 Asbestos Containing Materials

Asbestos containing material (ACM) will not be used in the design of new structures or systems. In the event no other material is available which will perform the required function or where the use of other material would be cost prohibitive, a waiver for the use of asbestos containing materials must be obtained from CETAC.

3.10.9.1 Existing Construction

Asbestos containing materials (ACM) presently included in existing construction to be rehabilitated or otherwise modified as a result of this project, shall be removed and a non-asbestos containing material substituted in lieu thereof.

3.10.9.2 Suspected Asbestos Containing Materials

All such structures and systems shall be inspected to determine the presence or probable presence of ACM. When ACM is suspected, a documented survey will be performed. The survey will be developed into an abatement design and will be made a part of the design documents. In the event no other material is available which will perform the required function or the use of a substitute material would be cost prohibitive due to initial cost and tear-out of existing construction, a waiver for the retention of the asbestos containing material must be obtained from the Contracting Officer.

3.11 VALUE METHODOLOGY/VALUE ENGINEERING

The Design-Build Contractor during the course of his design shall be alert for and shall identify those high-cost low-value items or areas which he considers may be accomplished in different ways that will increase the value of the project at the same or less cost. Potential value engineering study items shall be reported to the Value Engineer through the Contracting Officer.

3.11.1 Performance Oriented Value Engineering Change Proposal (VECP)

In reference to Contract Clause 52.248-3, "Value Engineering - Construction", the Government may refuse to entertain a "Value Engineering Change Proposal" (VECP) for those "performance oriented" aspects of the Contract Documents which were addressed in the Design-Build Contractor's accepted contract proposal and which were evaluated in competition with other Proposers for award of this contract. For purposes of this clause, the term "performance oriented" refers to those aspects of the design criteria or other contract requirements which allow the Proposer or the Design-Build Contractor certain latitude, choice of and flexibility to propose in its accepted contract offer a choice of design, technical approach, design solution, construction approach or other approach to fulfill the contract requirements. Such requirements generally tend to be expressed in terms of functions to be performed, performance required or essential physical characteristics, without dictating a specific process or specific design solution for achieving the desired result.

3.11.2 Prescriptive Oriented Value Engineering Change Proposal (VECP)

The Government may consider a VECP for those "prescriptive" aspects of the Solicitation documents, not addressed in the Design-Build Contractor's accepted contract proposal or addressed but evaluated only for minimum conformance with the Solicitation requirements. For purposes of this clause, the term "prescriptive" refers to those aspects of the design criteria or other Solicitation requirements wherein the Government expressed the design solution or other requirements in terms of specific materials, approaches, systems and/or processes to be used. Prescriptive aspects typically allow the Proposers little or no freedom in the choice of design approach, materials, fabrication techniques, methods of installation or other approach to fulfill the contract requirements.

3.12 SUBMITTAL OF CONTRACTOR FURNISHED DESIGN DOCUMENTS

The requirements of this paragraph pertain to the submittal of design documents, specifications, design calculations, surveys, testing reports and other documents prepared by the Design-Build Contractor to meet the design requirements of this project.

3.12.1 Geo-technical

3.12.1.1 Design Analysis

The Design-Build Contractor shall submit in the design analysis catalog cuts, manufacturer's data for the following:

3.12.1.2 Specifications

Specifications for all civil utilities shall include:

3.12.1.3 Design Drawings

1 ea. Full Size, 2 ea. Half-Size Design drawings shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.4 Manufacturer's recommendations, instructions, and certifications

Shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.5 Samples

Samples shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.6 Schedules

Schedules shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.7 Reports

Reports shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.8 Records

Records shall be submitted for the following:

Afghanistan Engineer District (AED)

Engineering Studies. Occasionally, in addition to the items previously mentioned, engineering studies that relate to specific problems or surveys may be required. The necessary instructions regarding the preparation of such reports must be added by the Specification Writer as appropriate.

3.12.2 Civil, Site Planning and Layout

3.12.3 Water, Wastewater, and Solid Waste Systems

3.12.4 Architectural/Interior Design

3.12.5 Structural

3.12.6 Force Protection Design Procedures for the Protection of United States Forces

3.12.7 Fire Protection and Life Safety

3.12.8 Heating, Ventilating, and Air Conditioning

3.12.9 Plumbing

3.12.10 Special Mechanical Systems and Equipment

3.12.11 Electrical

3.12.12 Power Generation

3.12.13 Power Transmission and Distribution

3.12.14 Communications

3.12.15 Corrosion Prevention and Control

3.12.16 Renovation Design

3.12.17 Accident Prevention and Safety

3.13 SUBMITTAL OF CONTRACTOR FURNISHED DESIGN DRAWINGS

3.13.1 Geo-technical

3.13.2 Civil, Site Planning and Layout

3.13.3 Water, Wastewater, and Solid Waste Systems

3.13.4 Architectural/Interior Design

3.13.5 Structural

3.13.6 Force Protection Design Procedures for the Protection of United States Forces

3.13.7 Fire Protection and Life Safety

3.13.8 Heating, Ventilating, and Air Conditioning

3.13.9 Plumbing

3.13.10 Special Mechanical Systems and Equipment

3.13.11 Electrical

3.13.12 Power Generation

3.13.13 Power Transmission and Distribution

3.13.14 Communications

3.13.15 Corrosion Prevention and Control

3.13.16 Renovation Design

3.13.17 Accident Prevention and Safety

3.14 GOVERNMENT APPROVED CONSTRUCTION SUBMITTALS (Required During Construction)

3.14.1 General

Since this contract requires that the drawings and specifications specify specific proprietary materials, equipment, systems, and patented processes by trade name, make, or catalog number, it is anticipated that construction shop drawings will primarily be limited to testing, construction plans (e.g., Contractor Quality Control, Accident Prevention, Resident Management System, Area Use etc), schedules (Project Schedule/Network Analysis), certificates of compliance, reports, records/statements and variations.

3.14.1.1 Variations

After design submittals have been reviewed and cleared for construction by the Contracting Officer, no submittal for the purpose of substituting materials, equipment, systems, and patented processes will be considered by the Government unless submitted in accordance with the paragraph entitled VARIATIONS.

3.14.1.2 Additional Shop Drawings and Submittals

In accordance with the paragraph entitled DESIGN DISCREPANCIES, the Government may request the Design-Build Contractor to provide additional shop drawing and submittal type data subsequent to completion of the design.

3.14.2 Incomplete Design

The Design-Build Contractor shall not use construction submittals as a means to supplant and/or supplement an incomplete design effort.

3.14.3 Government Approval of Construction Submittals

The approval of construction submittals by the Contracting Officer shall not be construed as a complete check, but will indicate only that the general method of design construction, materials, detailing and other information are satisfactory. Approval will not relieve the Design-Build Contractor of the responsibility for any error which may exist, as it is the sole responsibility of the Design-Build Contractor to certify that each submittal has been reviewed in detail and is in strict conformance with all the contract documents and design criteria referenced therein.

Virtually all design related construction submittals can and must be incorporated directly into the design specifications and drawings prepared by the Design-Build Contractor. Since the Design-Build Contractor has sole responsibility for the design, procurement, and construction, impediments do not exist which would impair his ability to specifically identify what is being furnished to the Government prior to the start of construction. Generic/non-proprietary specifications are indicative of an incomplete design effort and as such must be rejected as unacceptable

3.14.4 Submittals

Submittals (other than shop drawings) shall be limited to items such as Plans (e.g., Quality Control Plan, Accident Prevention Plan, Area Use Plan etc.),Certificates of Compliance, Installation Instructions, Manufacturer's Catalog Data, Descriptive Literature/Illustrations, Factory and Field Test Reports, Performance and Operational Test Data Reports, Records, Operation and Maintenance Manuals, and required variations.

3.14.5 Government Review

Upon completion of review of construction submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. two (2) copies of the submittal will be retained by the Contracting Officer and one (1) copy of the submittal will be returned to the Design-Build Contractor.

3.15 FOR INFORMATION ONLY SUBMITTALS

These submittals shall be checked, stamped, signed and dated by the Design-Build Contractor's Quality Control Engineer, certifying that such submittal complies with the contract requirements. All Contractor submittals shall be subject to review by the Government at any time during the course of the contract. Any Contractor submittal found to contain errors or omissions shall be resubmitted as

one requiring "approval". No adjustment for time or money will be allowed for corrections required as a result of noncompliance with plans or specifications. Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. These submittals will be used for information purposes. The Government reserves the right to require the Design-Build Contractor to resubmit any item found not to comply with the contract. This does not relieve the Design-Build Contractor from the obligation to furnish material conforming to the plans and specifications and will not prevent the Contracting Officer from requiring removal and replacement if nonconforming material is incorporated in the work.

3.16 ATTACHMENTS

The following attachments form an integral part of this specification:

ENG FORM 4025 - Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificate of Compliance (2 pages)

TAC FORM 122-E - Contractor Furnished Design Documents Submittal Register

ENG FORM 4288 - Submittal Register

Select one of the following:
AED projects:

Figure 1 – From AEC CADD Standards all sheet/number description; AED title block

Figure 2 - From AEC CADD Standards all A-E logo/designed by/submitted by; AED title block

Figure 3 - From AEC CADD Standards all revision block; AED title block

Figure 4 - From AEC CADD Standards all Finished Format Size

-- End of Section -

Image showing the two main areas of the NMA –
The Parade Square in the bottom left and the DFAC Top Left

(The K Spans are to be constructed in the area of the DFAC)

Item-1: NMAA – Warehouse

Appendix-A1

A Clean area image of the construction site

Item-1: NMAA – Warehouse

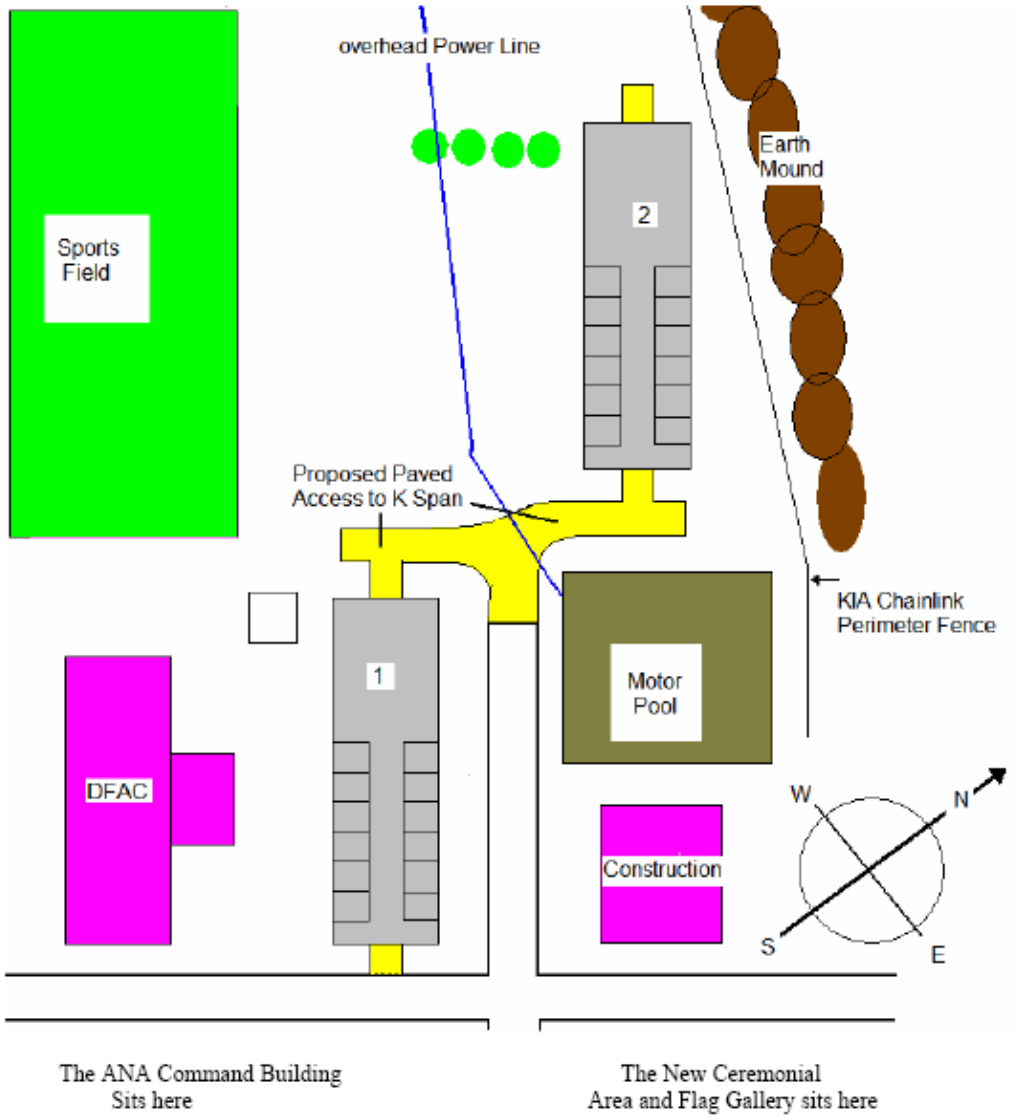
Appendix-A2

Image showing the general layout concept relative to existing DFAC

Item-1: NMAA – Warehouse

Appendix-A3

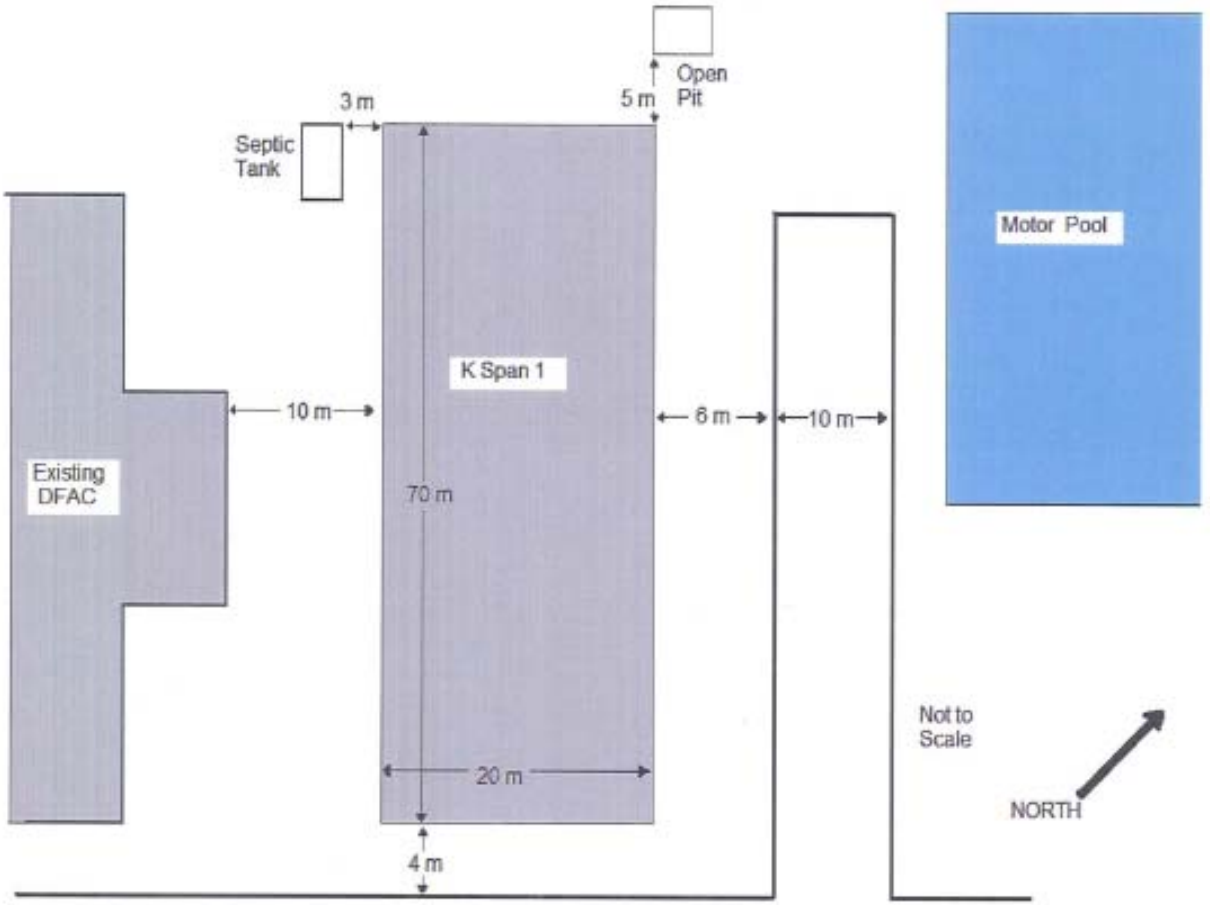
K Span General Area



Item-1: NMAA – Warehouse

Appendix-A4

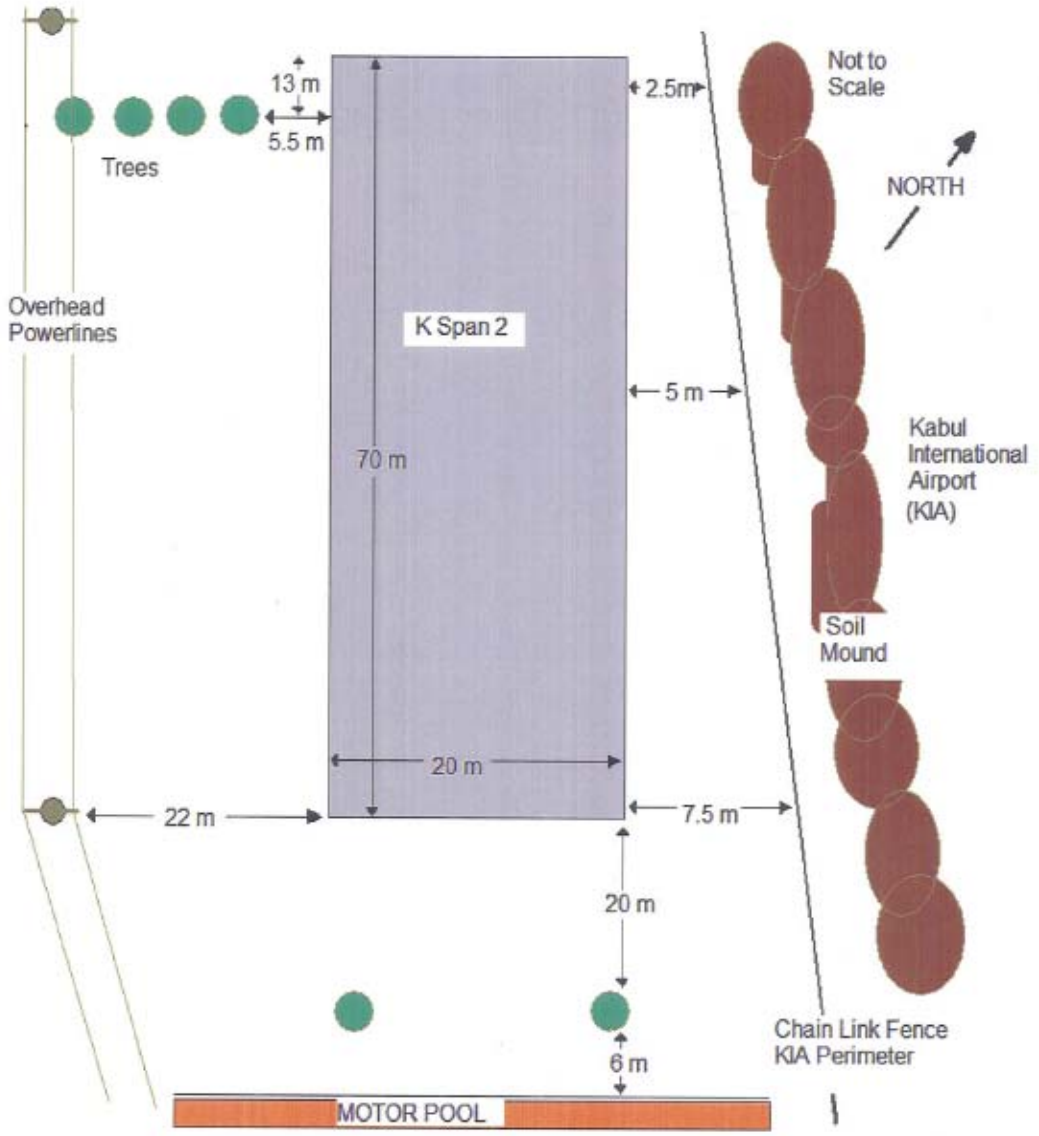
Immediate area of K Span 1



Item-1: NMAA – Warehouse

Appendix-A5

Immediate area of K Span 2



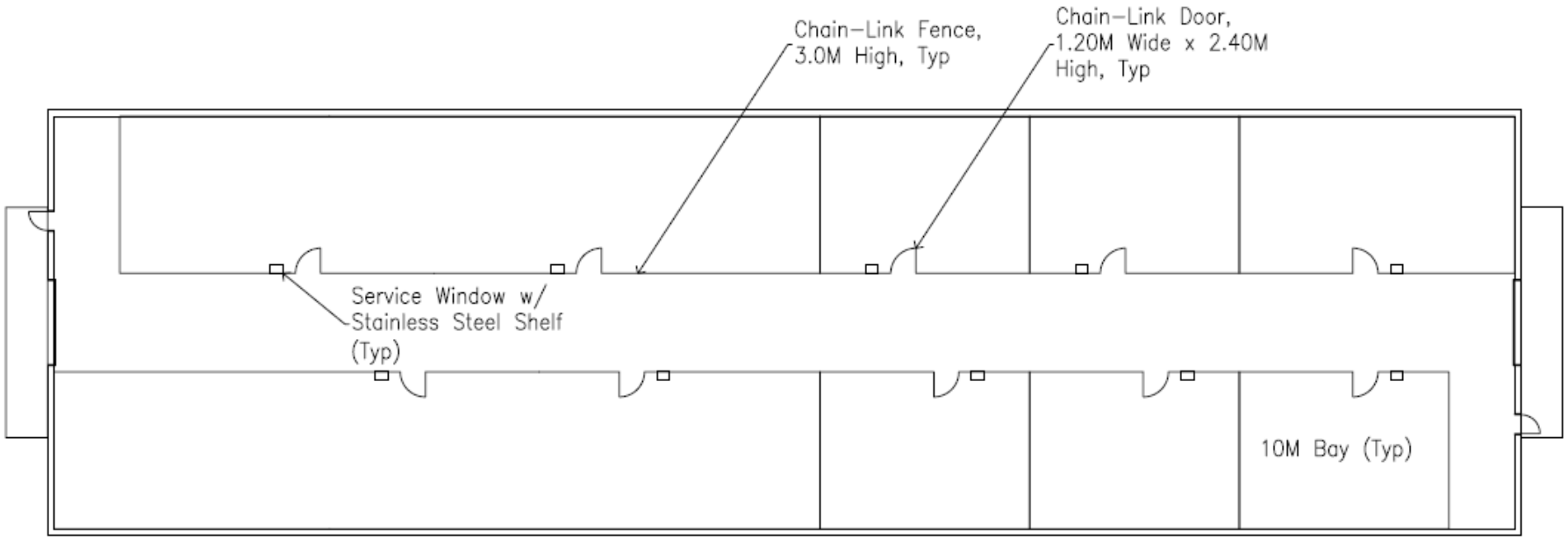
Item-1: NMAA – Warehouse

Appendix-A6

Site of K Span 2

Item-1: NMAA – Warehouse

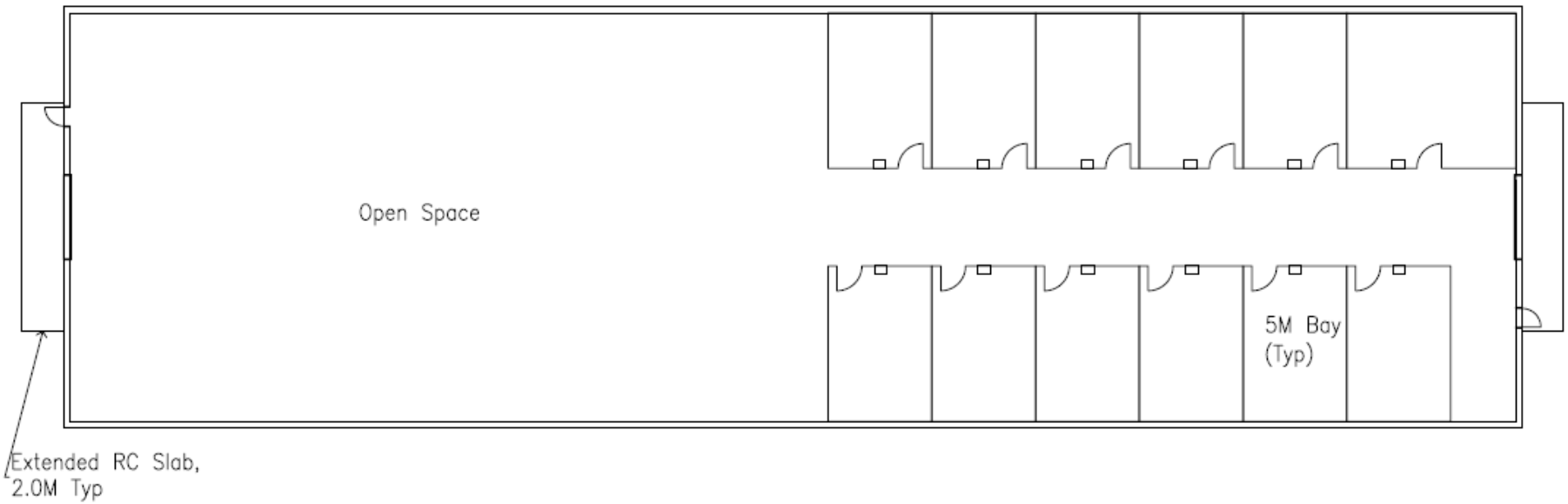
Appendix-A7



Warehouse–1

Item-1: NMAA – Warehouse

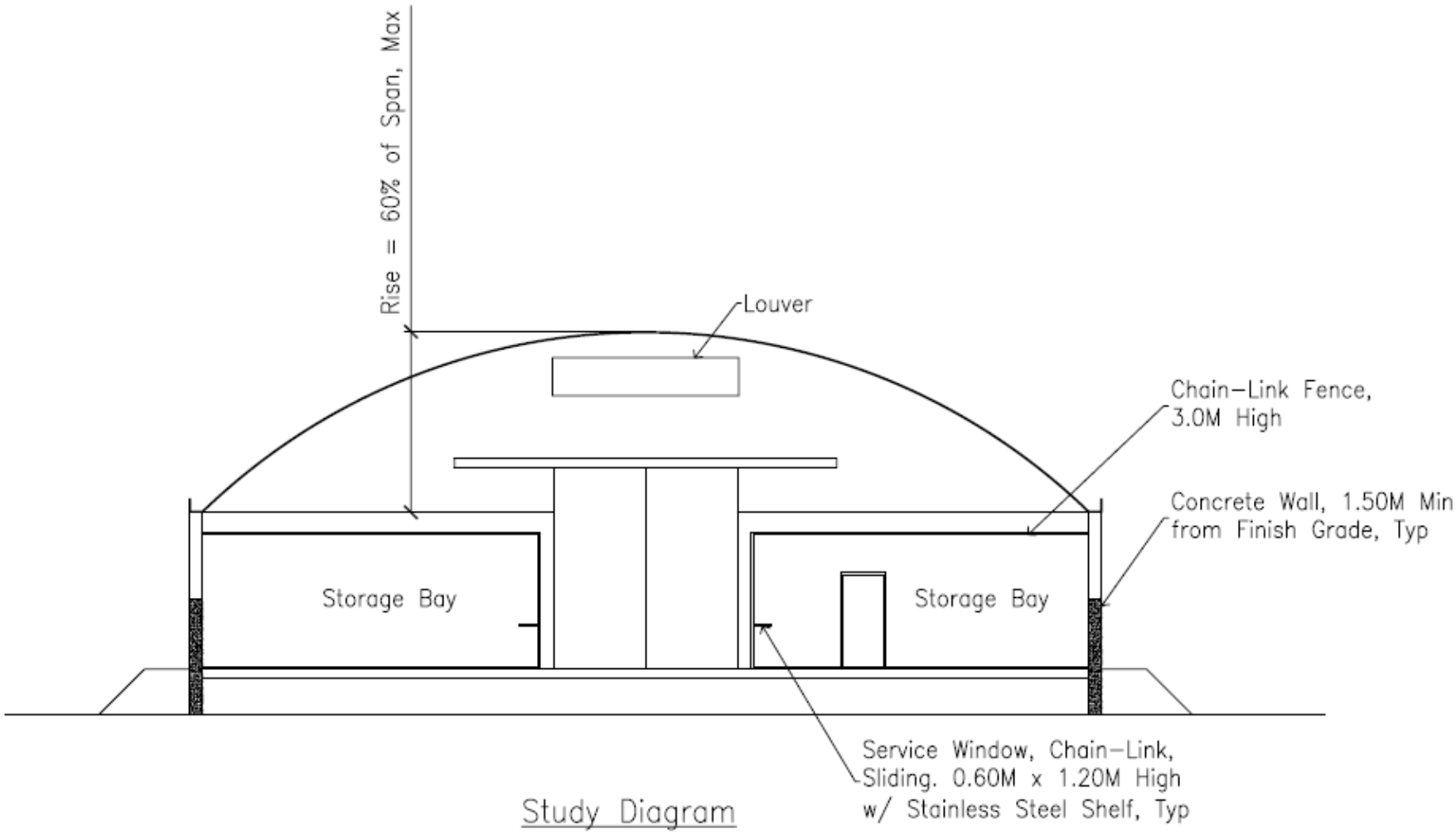
Appendix-A8



Warehouse–2

Item-1: NMAA – Warehouse

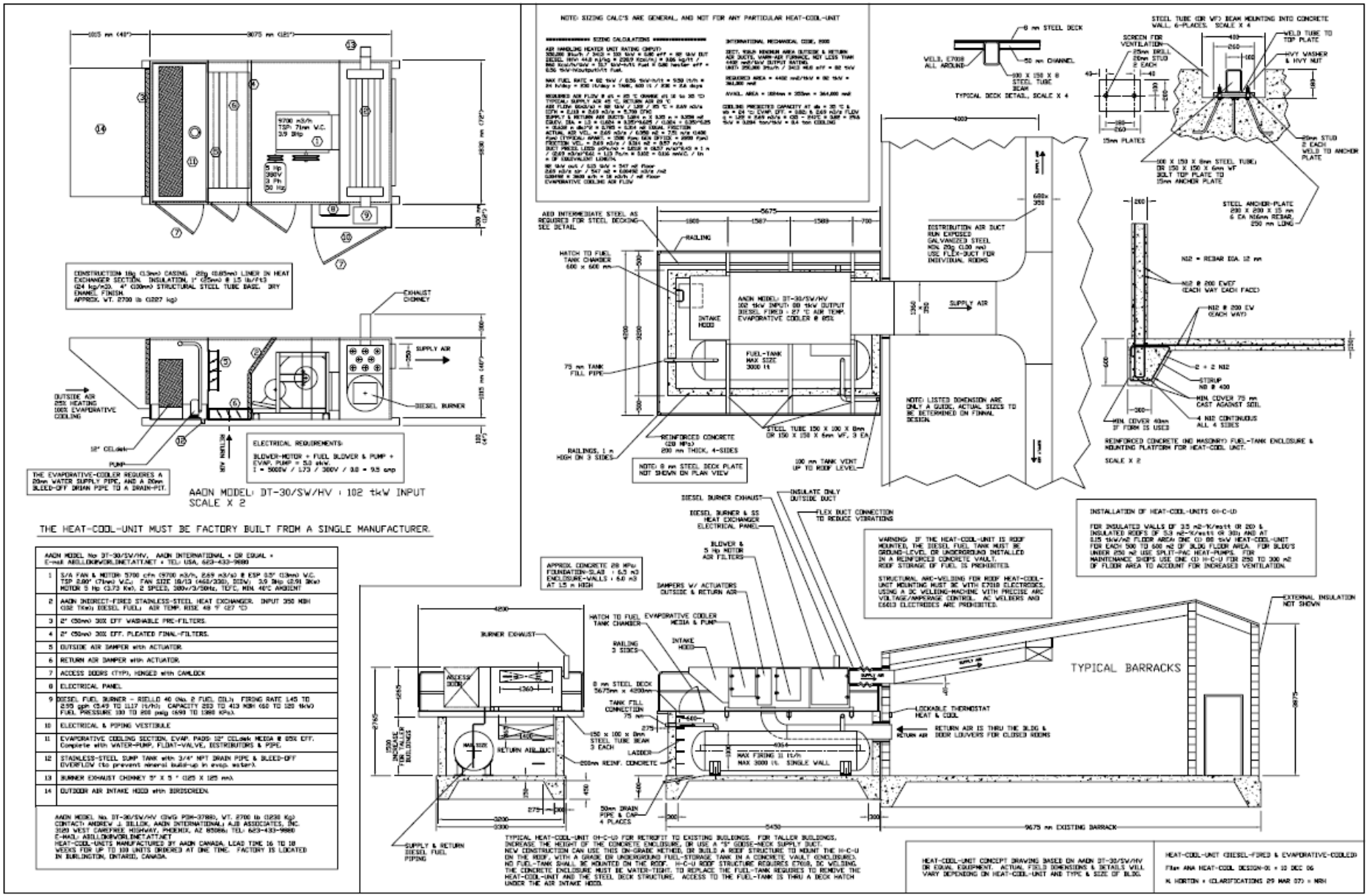
Appendix-A9

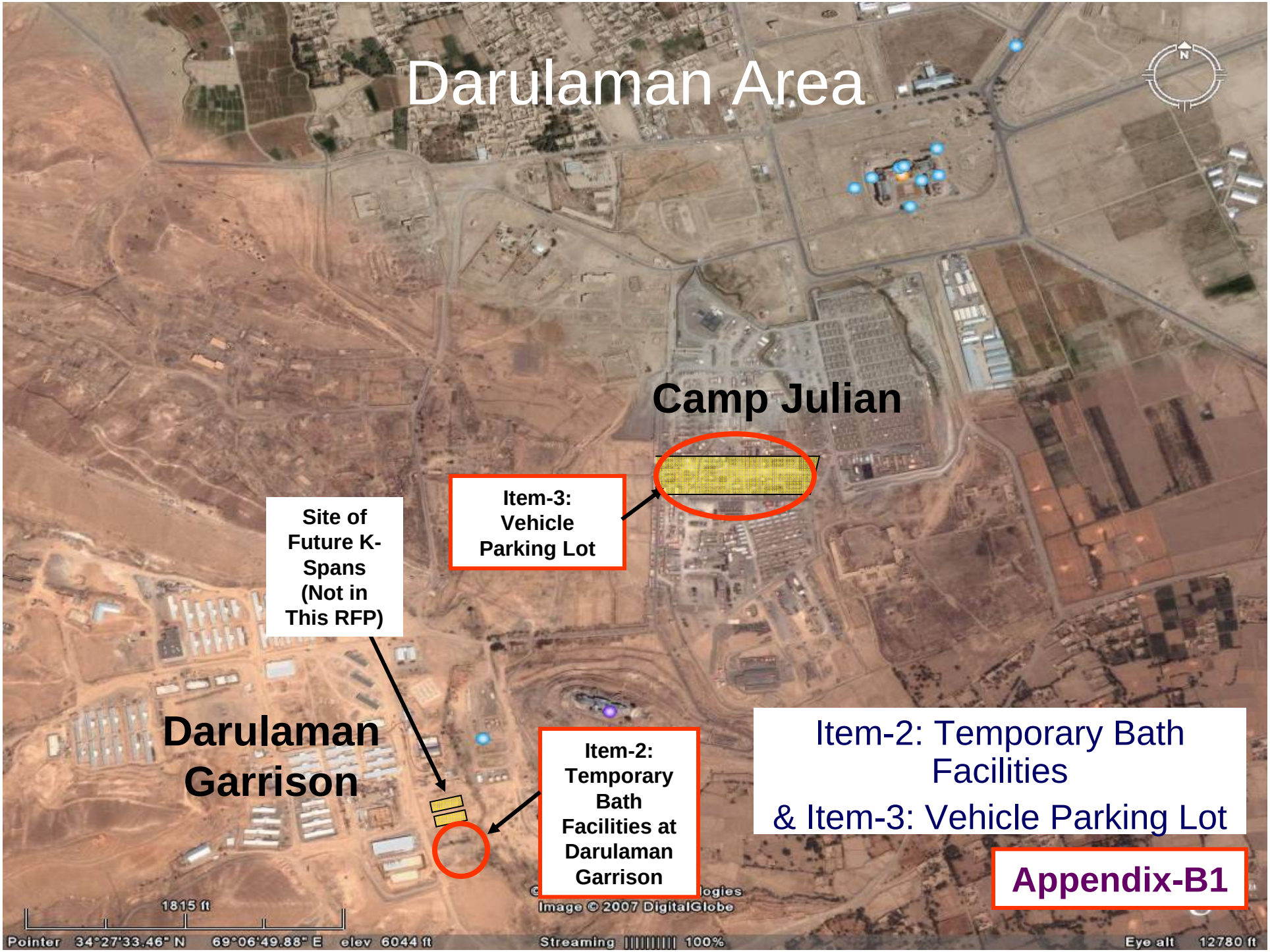


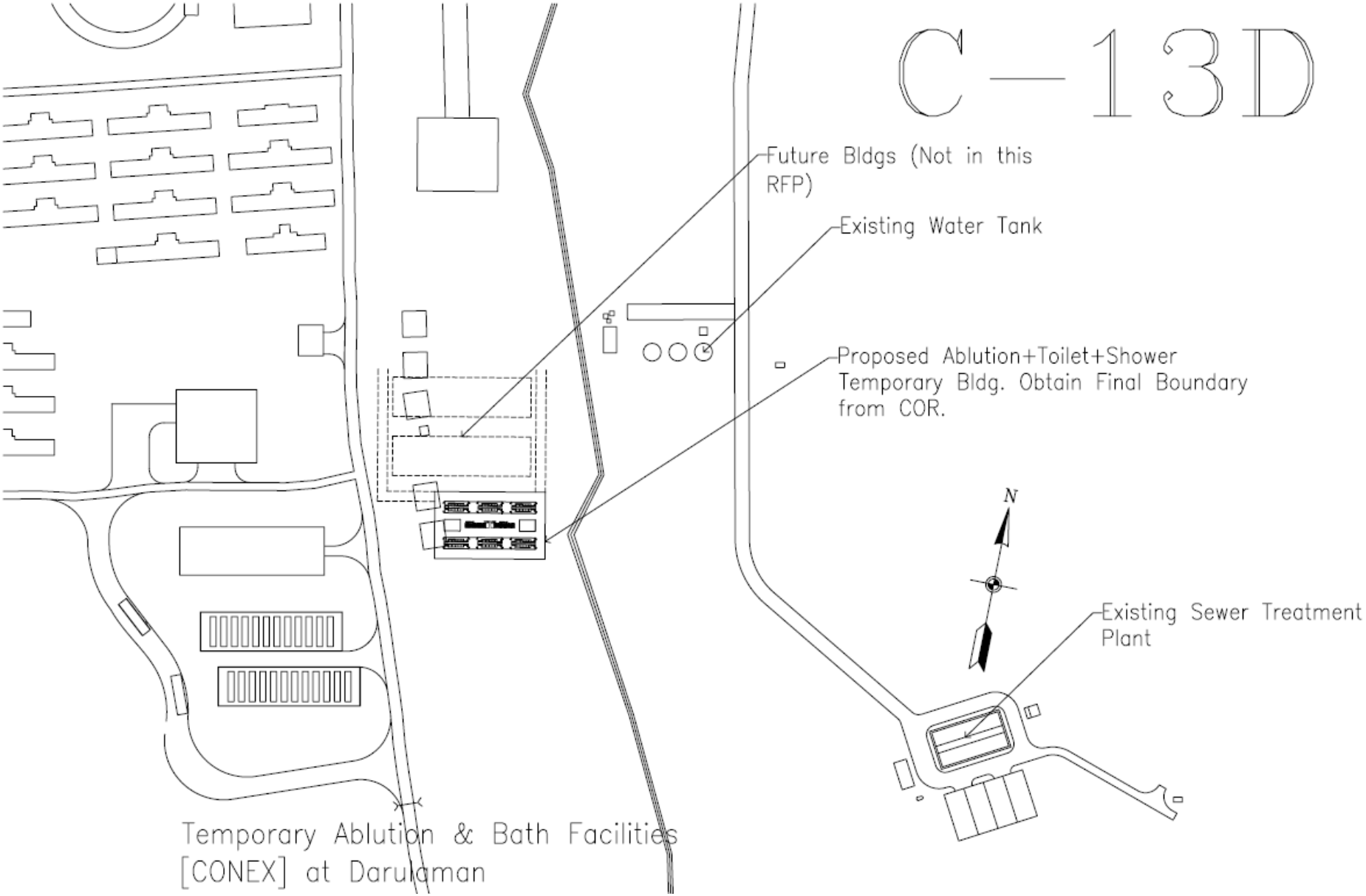
Study Diagram

Item-1: NMAA – Warehouse

Appendix-A10

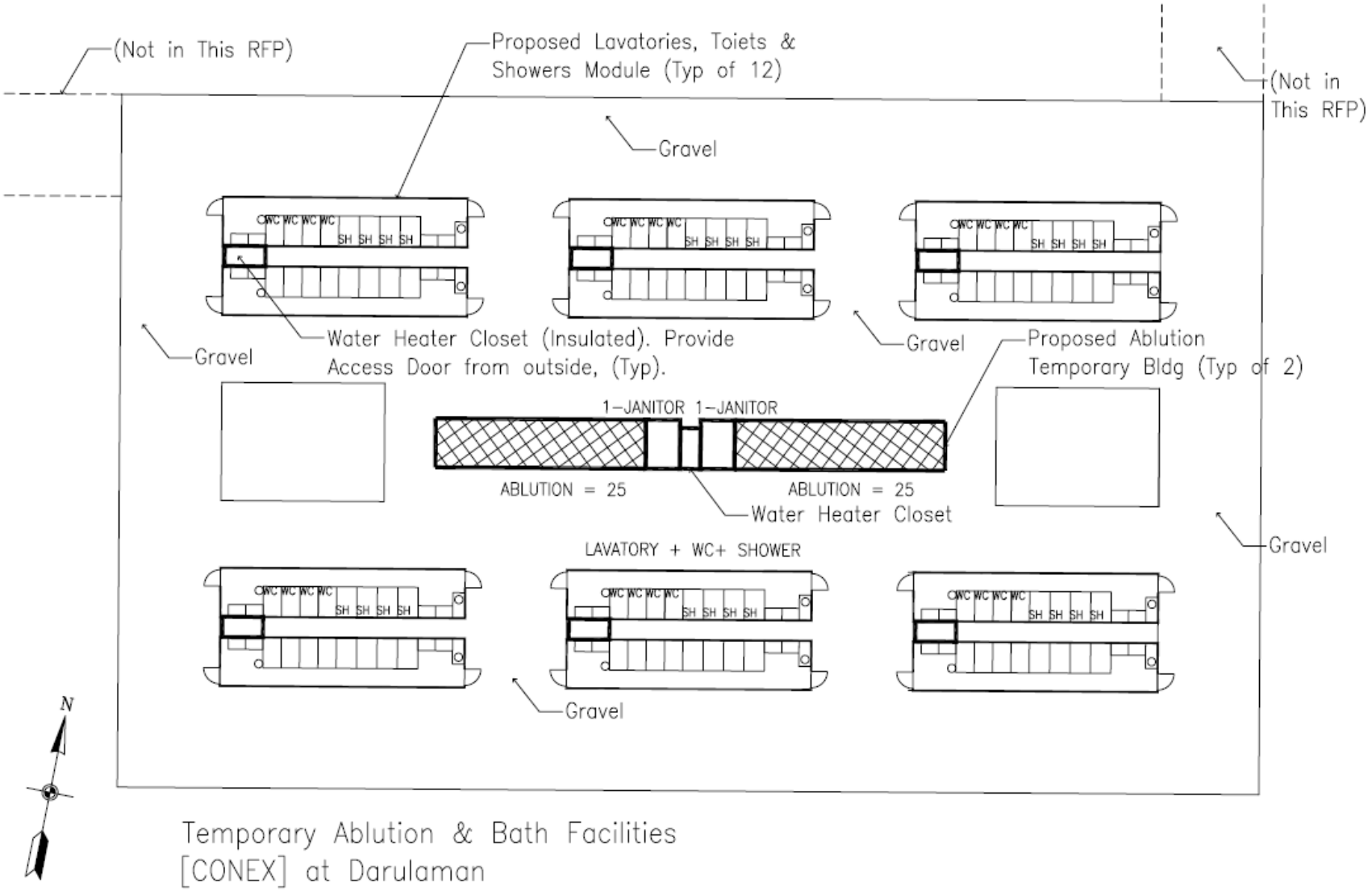

AADN MODEL: DT-30/SW/HV : 102 tkW INPUT
SCALE X 2
THE HEAT-COOL-UNIT MUST BE FACTORY BUILT FROM A SINGLE MANUFACTURER.
TYPICAL BARRACKS
9675 mm EXISTING BARRACK
Item-1: NMAA – Warehouse
Appendix-A11


Darulaman Area
Camp Julian
Item-3: Vehicle Parking Lot
Site of Future K-Spans (Not in This RFP)
Darulaman Garrison
Item-2: Temporary Bath Facilities at Darulaman Garrison
Item-2: Temporary Bath Facilities
& Item-3: Vehicle Parking Lot
Appendix-B1
1815 ft
Image © 2007 DigitalGlobe
Pointer 34°27'33.46" N 69°06'49.88" E elev 6044 ft
Streaming 100%
Eye alt 12780 ft



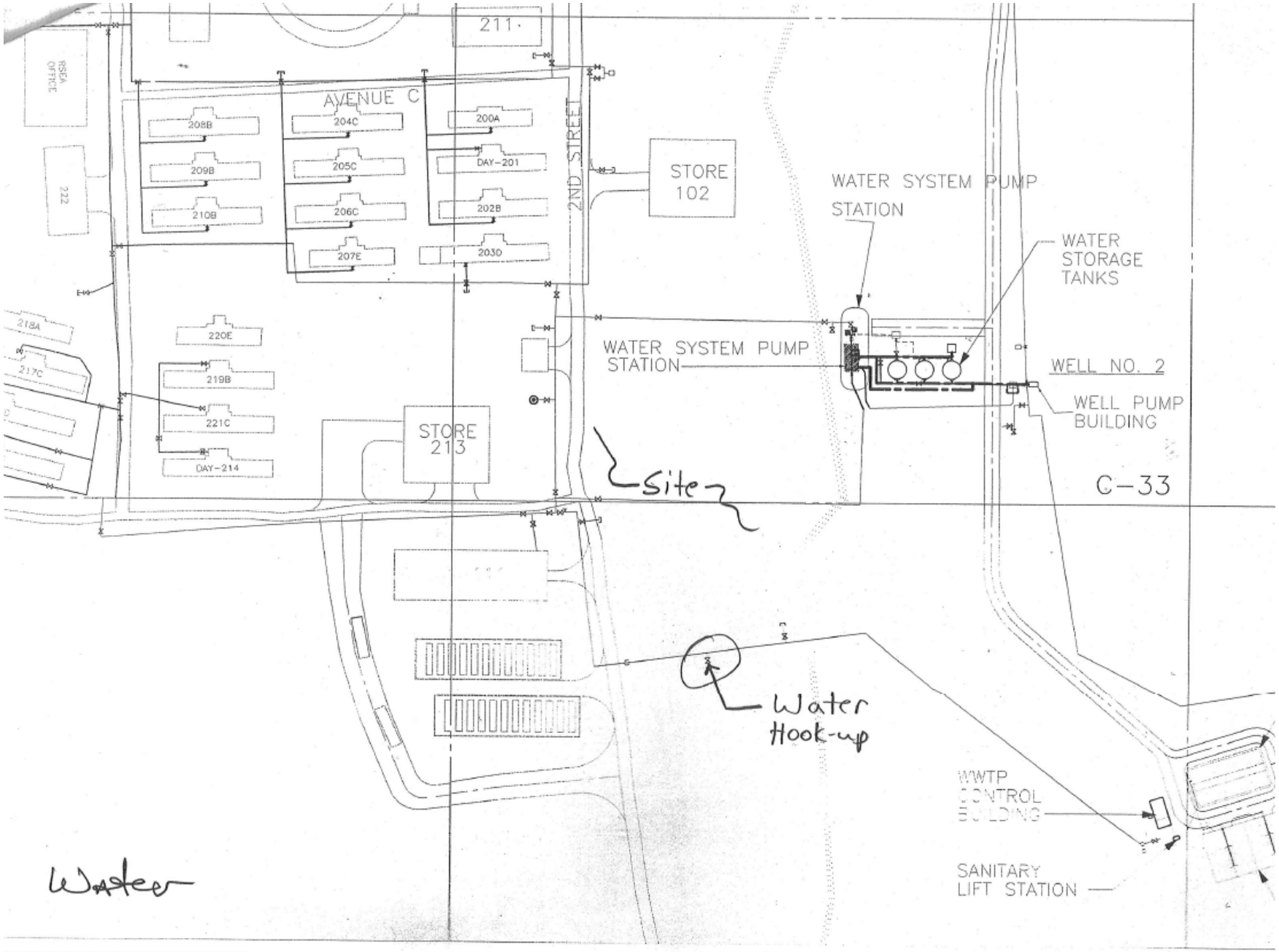
Item-2: Temporary Bath Facilities – CONEX at Darulaman Garrison

Appendix-B2



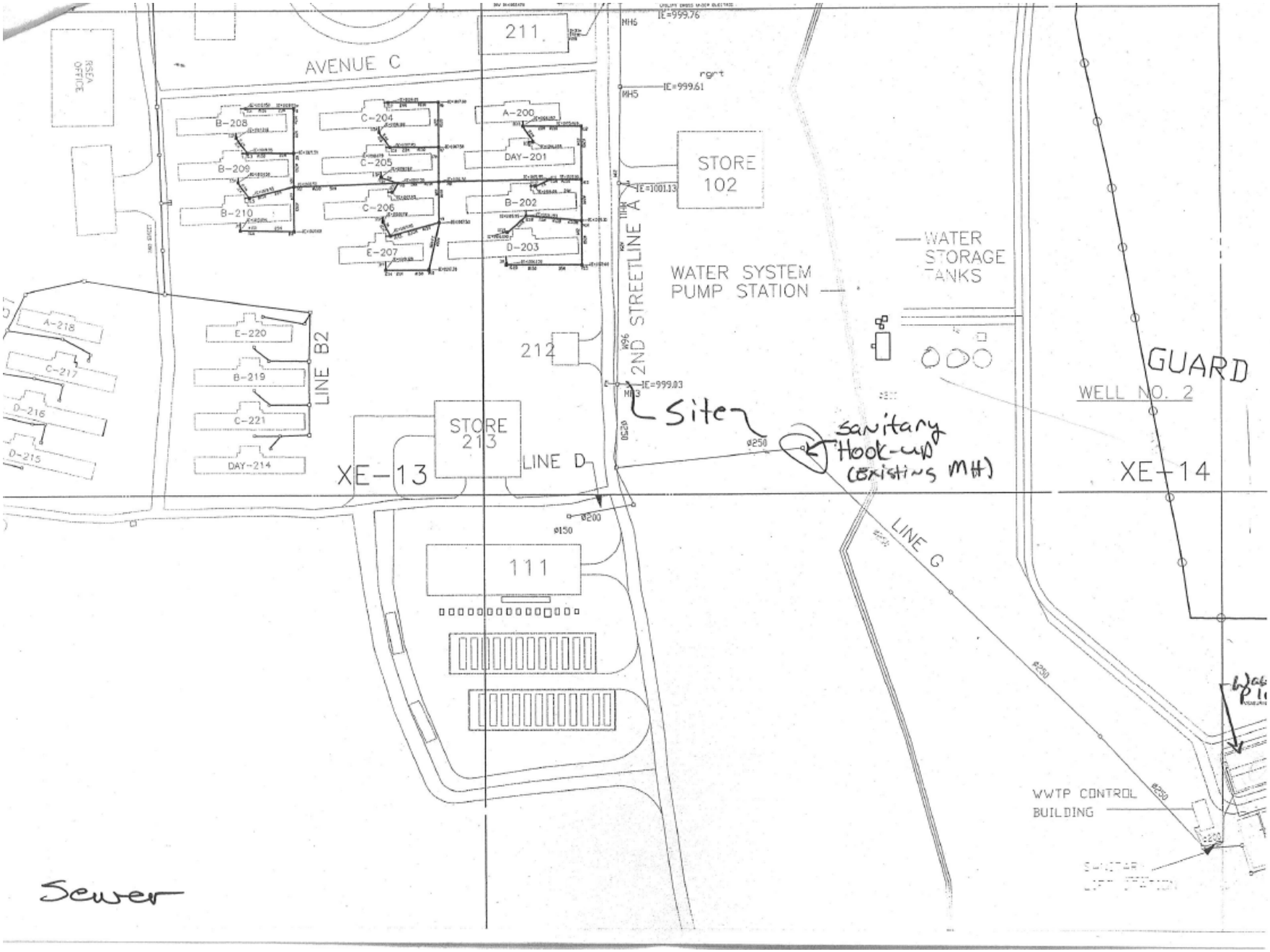
Item-2: Temporary Bath Facilities – CONEX at Darulaman Garrison

Appendix-B3



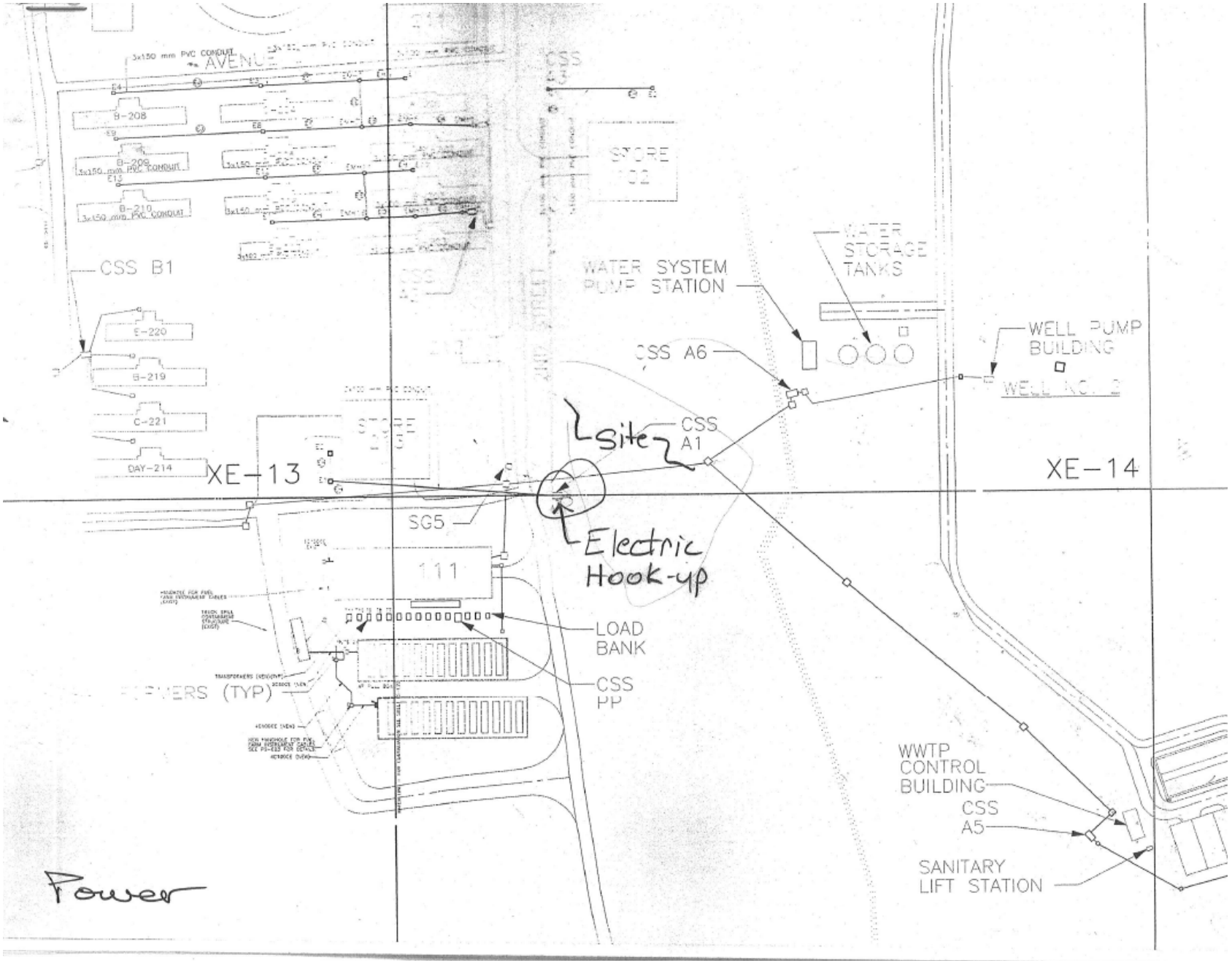
Item-2: Temporary Bath Facilities – CONEX at Darulaman Garrison

Appendix-B4



Item-2: Temporary Bath Facilities – CONEX at Darulaman Garrison

Appendix-B5



Item-2: Temporary Bath Facilities – CONEX at Darulaman Garrison

Appendix-B6

Project:	Warehouses at NMAA, Ablution+Toilet+Shower at Darulaman Garrison and CarPool at Camp Julian			
Occupancy:	For ANA staffs (Male ONLY). Approximately 1,000 Soldiers.		Building Type:	Temporary Bath CONEX at Darulaman

Minimum Number of Plumbing Fixture & Descriptions

Plumbing Fixture	Type	Number of Fixture per User	Specifications	Net Floor Space (including Fixture or Cabinets)
Ablution Area	Continuous Seating	1:20	Terrazzo Bench. Provide Hot & Cold Water Mixing Faucet. Provide Nonslip Ceramic Base with Ceramic Curb w/ Floor Drain (1 per 5 Persons Max).	Continuous Seating: Approx 0.90M x 0.90 M per Person.
Water Closet (WC)	Squat Comode (Eastern Type)	1:20	Eastern Closet: Raised Floor-mounted w/ Flush tank Assembly, Vitreous China	See WC Stall
Lavatory (or Sink)	Continuous Basin	1:20 (Faucet)	Stainless Steel Basin w/ Stanless Steel Legs. Provide Hot & Cold Water Mixing Faucet.	Continuous Basin: Spacing of Faucet = Min 0.90M OnCenter. Min, Depth = 0.75M. Dim of Last Faucet to Wall = 0.45M
Shower Stall	Fiberglass Shower Base.	1:20	Provide Hot & Cold Water Mixing Faucet.	

Project:	Warehouses at NMAA, Ablution+Toilet+Shower at Darulaman Garrison and CarPool at Camp Julian			
Occupancy:	For ANA staffs (Male ONLY). Approximately 1,000 Soldiers.		Building Type:	Temporary Bath CONEX at Darulaman

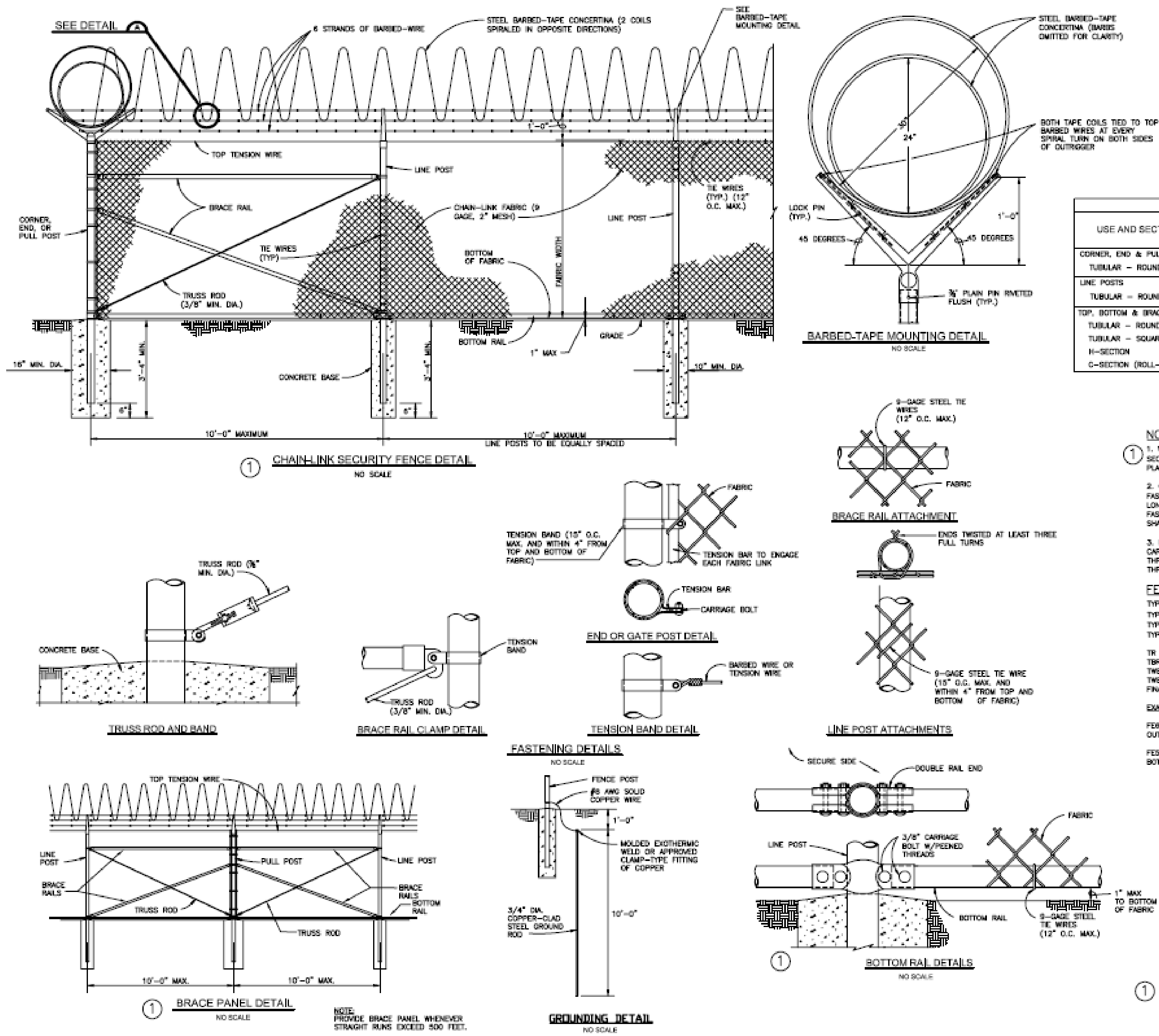
TOILET, SHOWER, JANITOR & UTILITIES CLOSET Descriptions

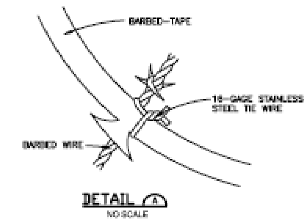
Compartment Type	Basic Components	Min Number of Room	Basic Construction	Approx Floor Space (including Fixture or Cabinets)
WC Stall	Eastern	(See Min Fixture Above)	Stainless Steel Panel & Doors	0.90M Wide x 1.5M Deep (Non-
Shower Stall	W/ Shower Base	(See Min Fixture Above)	Stainless Steel Panel & Doors	0.90M Wide x 1.70M Deep (Non-
Janitor Closet	W/ Mop Base + Water Heater	1 for TOILET/SHOWER serving 500 Users or 1 per 25 WC Stalls.	Steel Panels w/ Steel Door & Frame. Paint all Exposed Surface.	1.8 Wide x 2.4M Deep
Utilities Closet	Water Heater Closet	Provide 1 Water Heater per 2 Modular Units of CONEX as shown.	Metal Box with Door, Insulated.	Size as required for Installion & Routine Maintenance.

Project: **Warehouses at NMAA, Ablution+Toilet+Shower at Darulaman Garrison and CarPool at Camp Julian** 3-Nov-07

TOILET ACCESSORIES SCHEDULE

Toilet Accessories	Location	Number Required	Size (Nominal)	Material	Mount
Metal Shelf:	Over Lavatory	1 Set	0.60M Long	Stainless steel Commercial Grade	Wall-mounted. Provide Brackets.
Robe Hooks	At each TOILET Stall & at each SHOWER Stall	1 Set	Standard Size with Double Hooks	Stainless steel Commercial Grade	Wall-mounted.
Mirrors	Over Lavatory & Shelf	1 Each over Lavatory (or Faucet of Continuous Basin	0.6M x 0.9M per Faucet or Continuous to full Width of Basin	6mm Plate Glass	Wall-mounted. Bottom of Mirror shall be 1.1M AFF
Toilet Tissue Holder	Side Wall of WC Stall	1 Set for each WC	Double-Roll	Stainless Steel, Heavy Duty Grade with Non-removeable Tissue Holding Pin.	Wall Mounted Approximately 0.60M AFF
Grab Bars at Eastern WC Stall	Eastern WC & SHOWER	2 Sets per each Eastern WC	0.9M & 1.05M Long x 0.4M Diameter	Stainless steel, heavy duty, 18 gauge	Wall-mounted behind & Adjacent Wall of Eastern
Grab Bar for SHOWER	SHOWER	1 Set per Shower Stall	0.9M & 1.05M Long x 0.4M Diameter	Stainless steel, heavy duty, 18 gauge	Wall-mounted at Opposite side of Facet for SHOWER.
Paper Towel Dispenser	WC & SHOWER	1 Set per WC & 1 Set for Separate Shower Stall. 1 Set for combined WC & SHOWER room. Provide Multiple Units for large number of Users (1 Set per 8 Lavatories or Sink Faucet.	Standard Size (per End-user Supply)	Type 304, Stainless Steel w/ Tumbler key locking mechanism.	Wall-mounted 1.20M AFF, near Door or Lavatories.





STEEL POST SCHEDULE			
USE AND SECTION	MINIMUM OUTSIDE DIMENSIONS (NOMINAL)		
	FABRIC WIDTH 72" OR LESS	FABRIC WIDTH 84" TO 96"	FABRIC WIDTH 108" AND OVER
CORNER, END & PULL POSTS TUBULAR – ROUND	2.375" O.D.	2.875" O.D.	4.00" O.D.
LINE POSTS TUBULAR – ROUND	1.90" O.D.	2.375" O.D.	2.875" O.D.
TOP, BOTTOM & BRACE RAILS TUBULAR – ROUND TUBULAR – SQUARE H-SECTION C-SECTION (ROLL-FORMED)	1.66" O.D. 1.50" SQ. 1.625" X 1.50" 1.625" X 1.25"		

NOTES:

1. WIRE TIES, RAILS, POSTS, AND BRACES SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE SIDE OPPOSITE THE SECURE AREA.

2. ONLY 9-GAGE GALVANIZED STEEL TIE WIRES SHALL BE USED FOR FASTENING THE FENCE FABRIC TO FENCE POSTS AND RAILS. 16-GAGE, 6.5" LONG, STAINLESS STEEL DOUBLE LOOP BAR TIE WIRES SHALL BE USED FOR FASTENING FENCE FABRIC TO TENSION WIRES AND TRUSS RODS. HOG RINGS SHALL NOT BE ALLOWED ON SENSORED FENCES.

3. BOTTOM RAIL SHALL BE ATTACHED TO DOUBLE RAIL ENDS USING 3/8" CARRIAGE BOLTS AS SHOWN. ADDITIONAL HOLES SHALL BE DRILLED THROUGH BOTTOM RAIL ENDS TO INSURE THAT CARRIAGE BOLTS PASS THROUGH THE BOTTOM RAIL AS SHOWN.

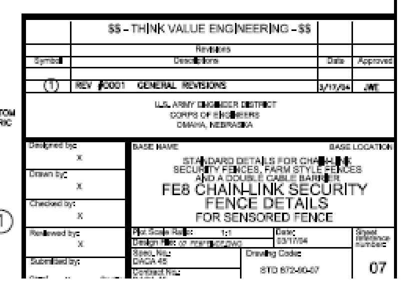
FENCE LEGEND:

TYPE FE5 – CHAIN-LINK FENCE WITHOUT BARBED-WIRE APRON
TYPE FE6 – CHAIN-LINK FENCE W/BARBED-WIRE ON SINGLE OUTRIGGER
TYPE FE7 – CHAIN-LINK FENCE W/BARBED-WIRE ON DOUBLE OUTRIGGER
TYPE FE8 – CHAIN-LINK FENCE W/BARBED-WIRE AND BARBED-TAPE ON DOUBLE OUTRIGGER
TR – FENCE WITH TOP RAIL AND TENSION WIRE AT BOTTOM
TBR – FENCE WITH TOP AND BOTTOM RAILS
TWB – TENSION WIRE TOP AND BOTTOM
TWBR – FENCE WITH TOP TENSION WIRE AND BOTTOM RAIL.
FINAL NUMBER IS FABRIC WIDTH IN INCHES.

EXAMPLES

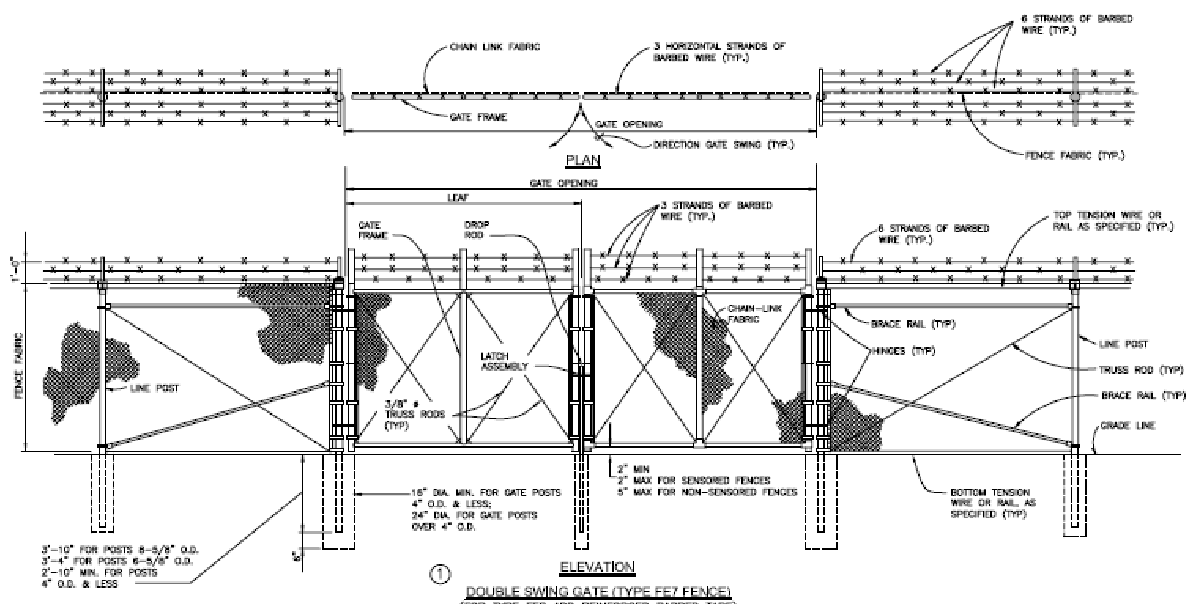
FE6-TR-72 – CHAIN-LINK SECURITY FENCE WITH BARBED-WIRE ON SINGLE OUTRIGGER, TOP RAIL, AND 72 INCH FABRIC WIDTH.

FE5-TWB-84 – CHAIN-LINK SECURITY FENCE WITH NO APRON, TOP AND BOTTOM TENSION WIRE, AND 84 INCH FABRIC WIDTH.



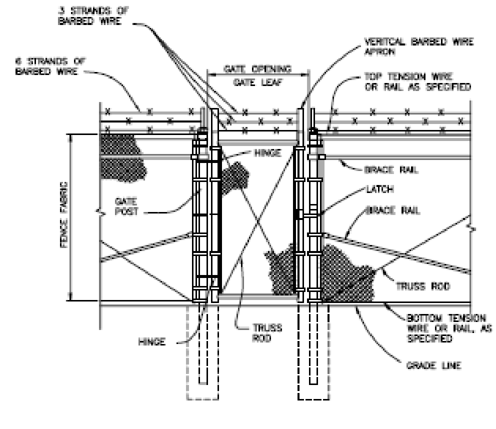
Item-3: Vehicle Parking Lot at Camp Julian

Appendix-B9

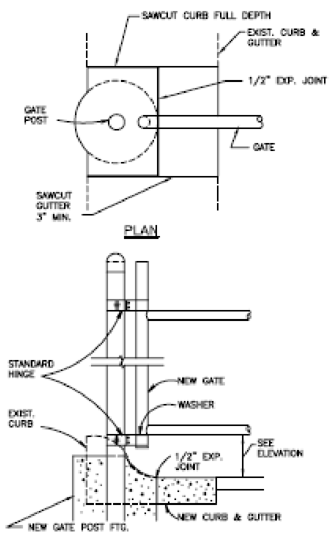


① ELEVATION

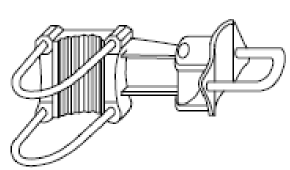
DOUBLE SWING GATE (TYPE FE7 FENCE)
(FOR TYPE FE8 ADD REINFORCED BARBED TAPE)
NO SCALE



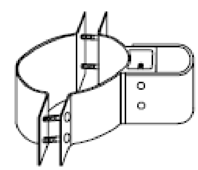
① PERSONNEL GATE
TYPE FE7 & FE8 FENCE
NO SCALE



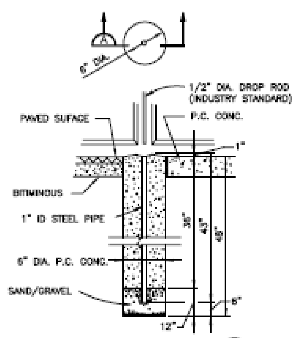
① GATE POST SECTION
AT CURB AND GUTTER
NO SCALE



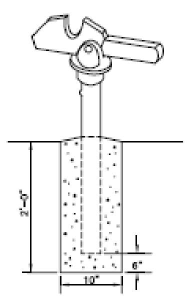
OFFSET HINGE



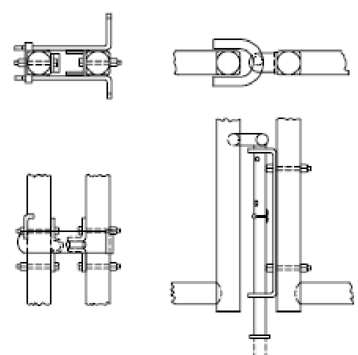
STANDARD HINGE



DROP ROD FOUNDATION (A)
NO SCALE



GATE KEEPER
(TO HOLD GATE OPEN)



LATCH ASSEMBLY

DROP ROD ASSEMBLY

SWING GATE DETAILS
NO SCALE

① GATE POST SCHEDULE

GATE LEAF WIDTH (NOMINAL)	OUTSIDE DIMENSION (NOMINAL)
6' OR LESS	2.875" OD 2.5" SQ
MORE THAN 6' TO 13'	4.0" OD
MORE THAN 13' TO 18'	6.625" OD
MORE THAN 18'	8.625" OD

① NOTES:

1. FOR NON-SENSORED FENCES, DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPE OF FENCE SECTIONS AND METHODS OF INSTALLATION THAT COMPLY WITH THE SPECIFICATIONS.

2. SWING GATES SHALL BE CONSTRUCTED WITH DROP RODS, PADLOCKS, LATCH ASSEMBLY AND GATE KEEPERS EXCEPT AS NOTED.

3. ALL GATE FRAMES SHALL BE A MINIMUM 1.90" NOMINAL (ROUND) OR 2.00" NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL-WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.

4. GATES SHALL BE DESIGNATED AS FOLLOWS:

FENCE TYPE – FE5, FE8, ETC.
FENCE HEIGHT – INCHES
TYPE OPENING – SO (SINGLE)
– DO (DOUBLE)
HINGE – RA (STANDARD)
– HO (OFFSET)
OPENING – FEET (CLEAR OPENING BETWEEN GATE POSTS)

EXAMPLES: FE6-84-DO-RA-24
FE5-48-SO-HO-6

$$ - THINK VALUE ENGINEERING - $$

Symbol	Descriptions	Date	Approved
①	REV #0001 GENERAL REVISIONS	3/17/04	JWE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by: X
Drawn by: X
Checked by: X
① Reviewed by: X
Submitted by:
CHIEF X SECTION

BASE NAME | BASE LOCATION

STANDARD DETAILS FOR CHAIN-LINK SECURITY FENCES, FARM STYLE FENCES AND A DOUBLE CABLE BARRIER

FE7/8 CHAIN-LINK SECURITY FENCE
GATE DETAILS

Plot Scale Ratio: 1:1
Date: 03/17/04
Spec. No.: DACA 45
Contract No.: DACA 45
Drawing Code: STD 872-90-10
Sheet reference number: 10

Item-3: Vehicle Parking Lot at Camp Julian

Appendix-B10